

III

U

Glenwood, 1906  
Balfour  
Malvern  
Red Oak.

Hamburg.



51-05  
10



1  
Glenwood, Ia - Aug. 29 - 1906  
Examination cut on street leading  
from new C.B. & C. depot  
to town, down hill.

It is 6-8 ft. deep, consists  
of fine yellow loam, & has  
an occasional band <sup>where</sup> of  
lime nodules.

There are fossils scattered  
all through, on both  
sides of street.



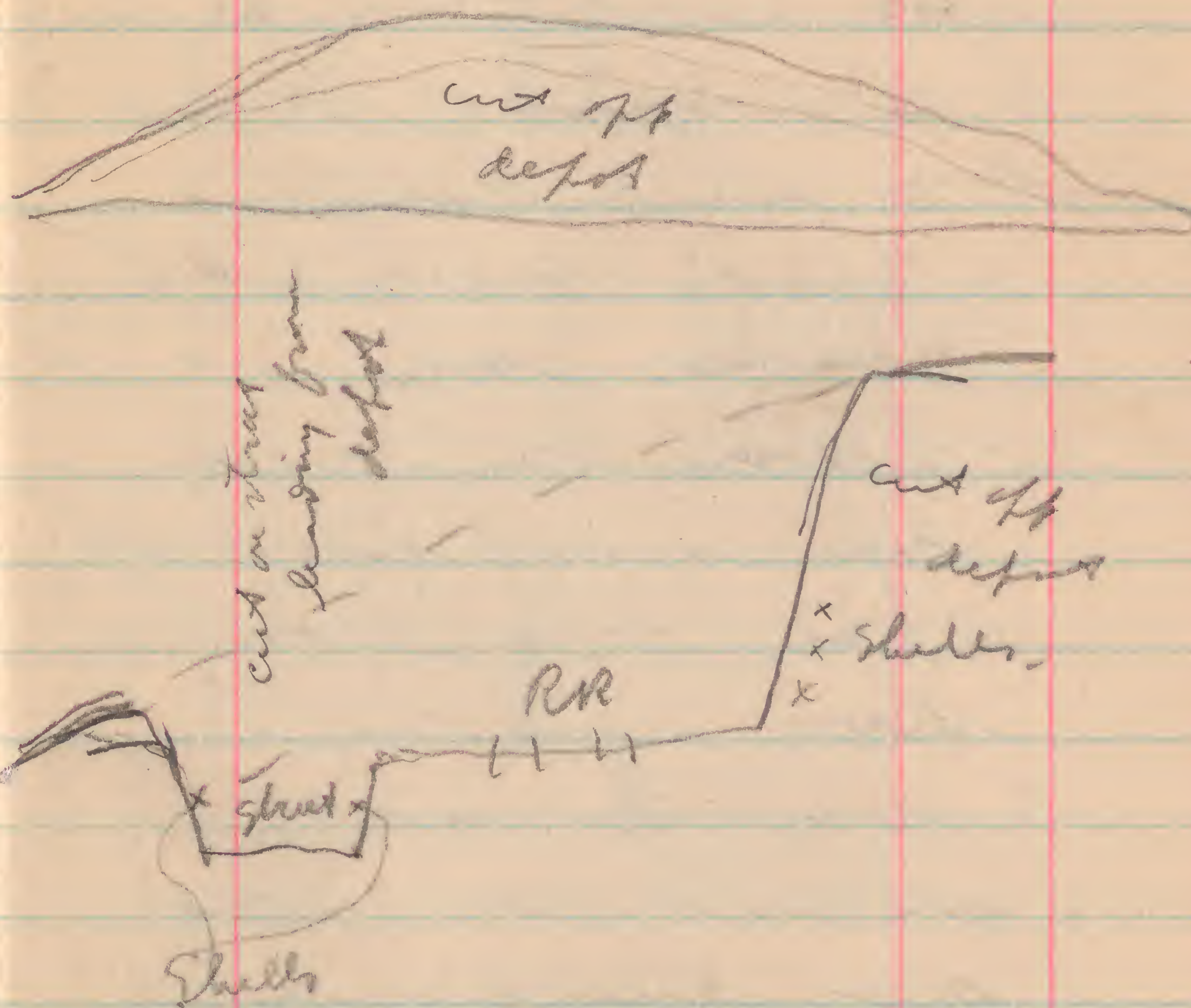
Met Mr. Seth Dean  
 & secured much information.  
 Will give me details of beds  
 in wells.

A cut 25 ft. deep in  
 sp. new CTD+O deposit  
 at Glendon. The  
 upper 5 or 6 ft. is  
 looser & redder. This  
 shades below into a  
 yellow loess streaked  
 with iron, iron  
 with occasional horizontal  
 plates, a few  
 lime nodules, &  
 in one place a faint  
 short line of broken  
 shells.

Fossils are irregularly

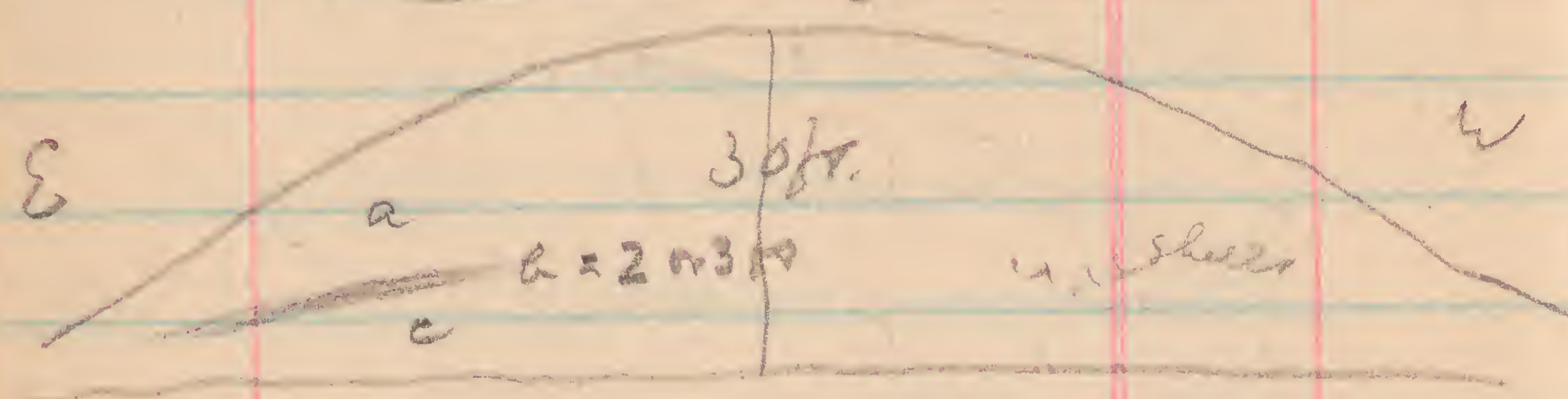
distributed, chiefly in  
 lower 10 ft.

See nodules & samples  
 One from 4 ft from base &  
 the other 3 ft from top.





4

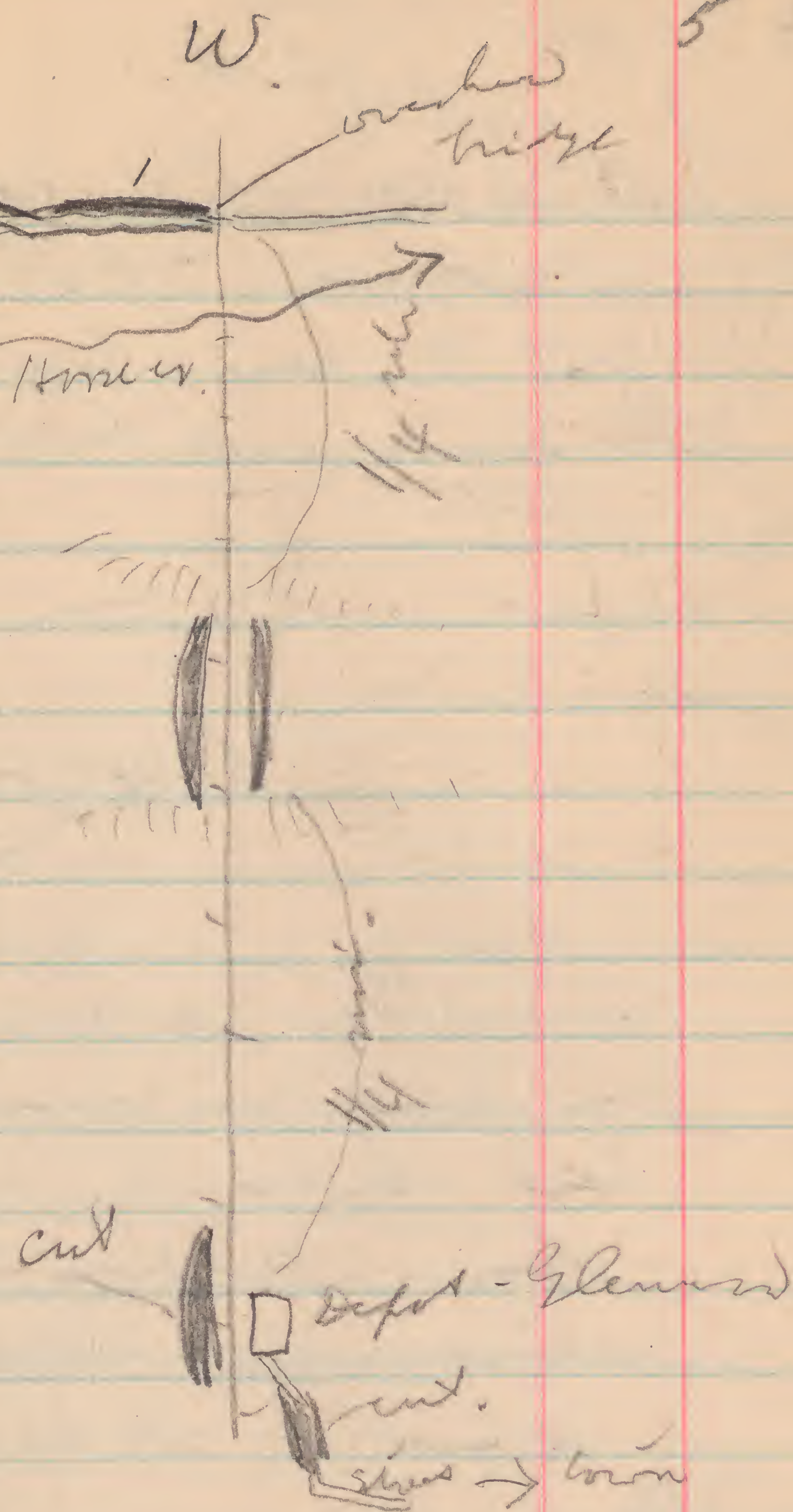
1<sup>st</sup> cut W. of depot

At E. end it shows loess yellow, reddish above, at a, b is a band of bluish loess which disappears as far as I could make out toward the west

at W. end the loess is like in cut off depot, & has shells, nodules, etc.

c. is again irregularly yellow, or brown from iron, & appears to be more strongly laminated as is by water.

The yellow loess above & below b. have blue horizontal bands & streaks. (by certain iron rust-bands) (good sized soft ones) a, b, c show lamination when broken.

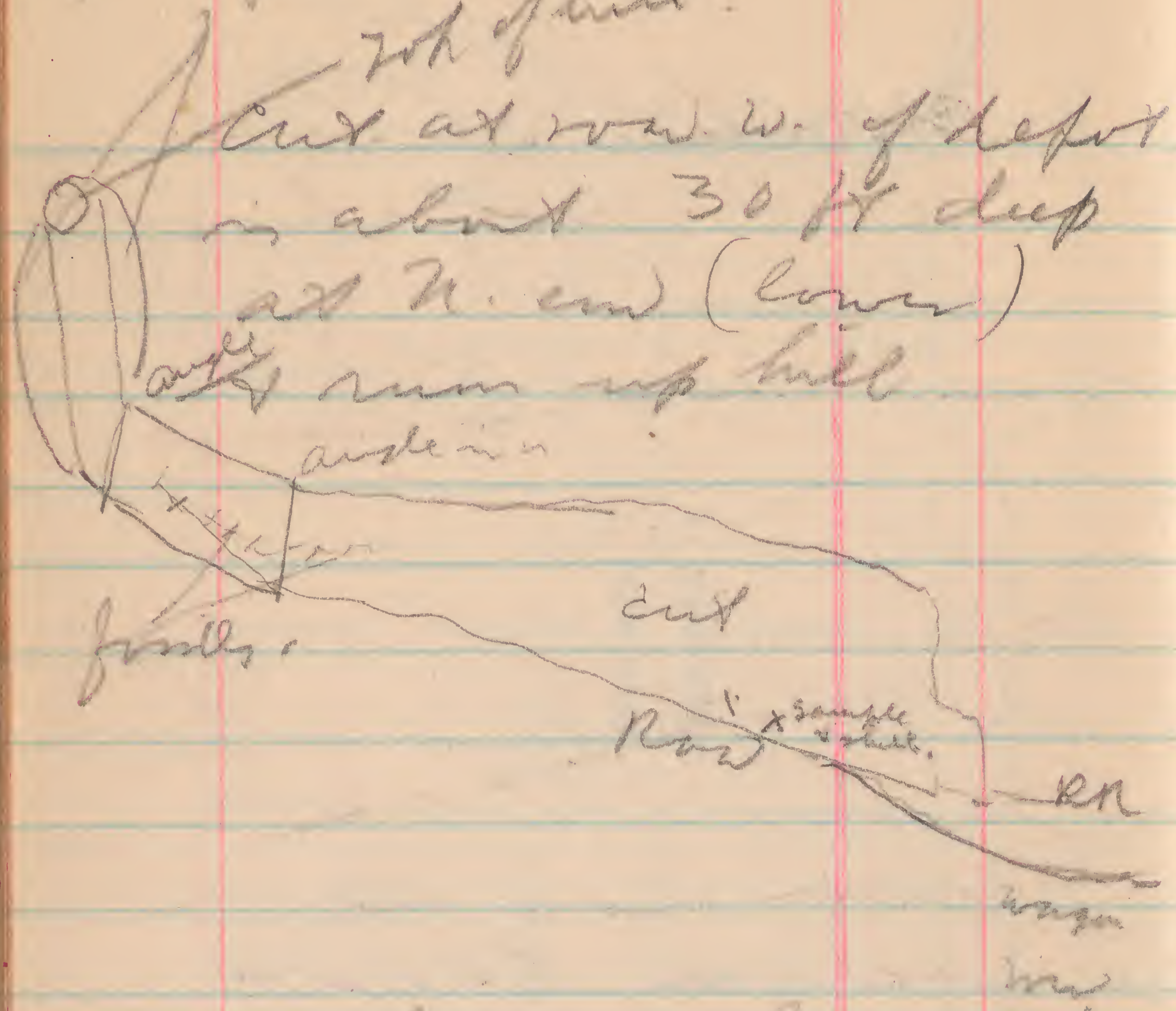


5



6

few or no fossils  
top of hill



Few fossils are found in  
cut at road.

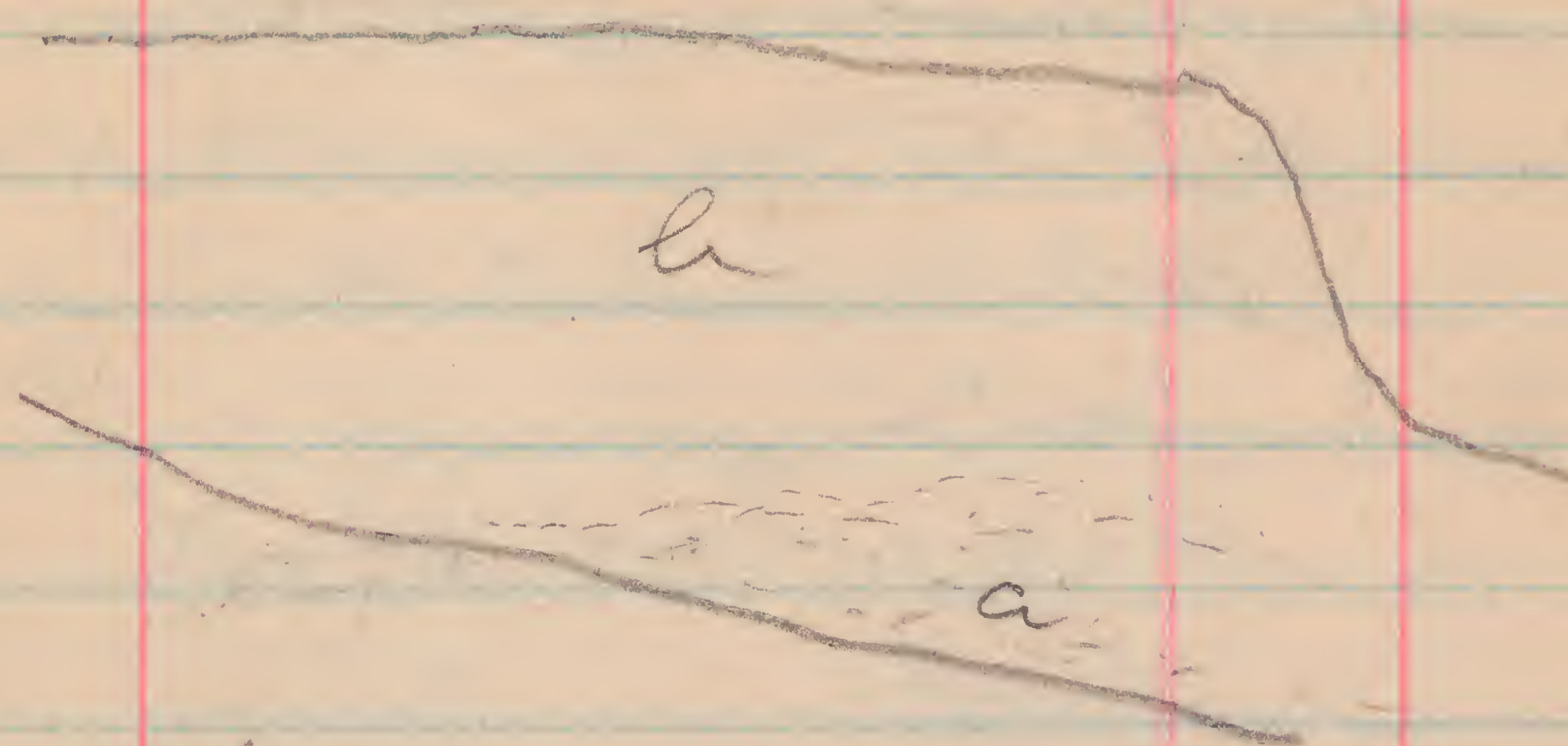
This is Udden's Kelly  
or exposure. Dean  
says it is Horse creek.

W.



7

Cut shows almost no  
fossils - none above.



Lower end of cut 1 on  
road W. of depot  
(a is darker colored, as  
if old soil.

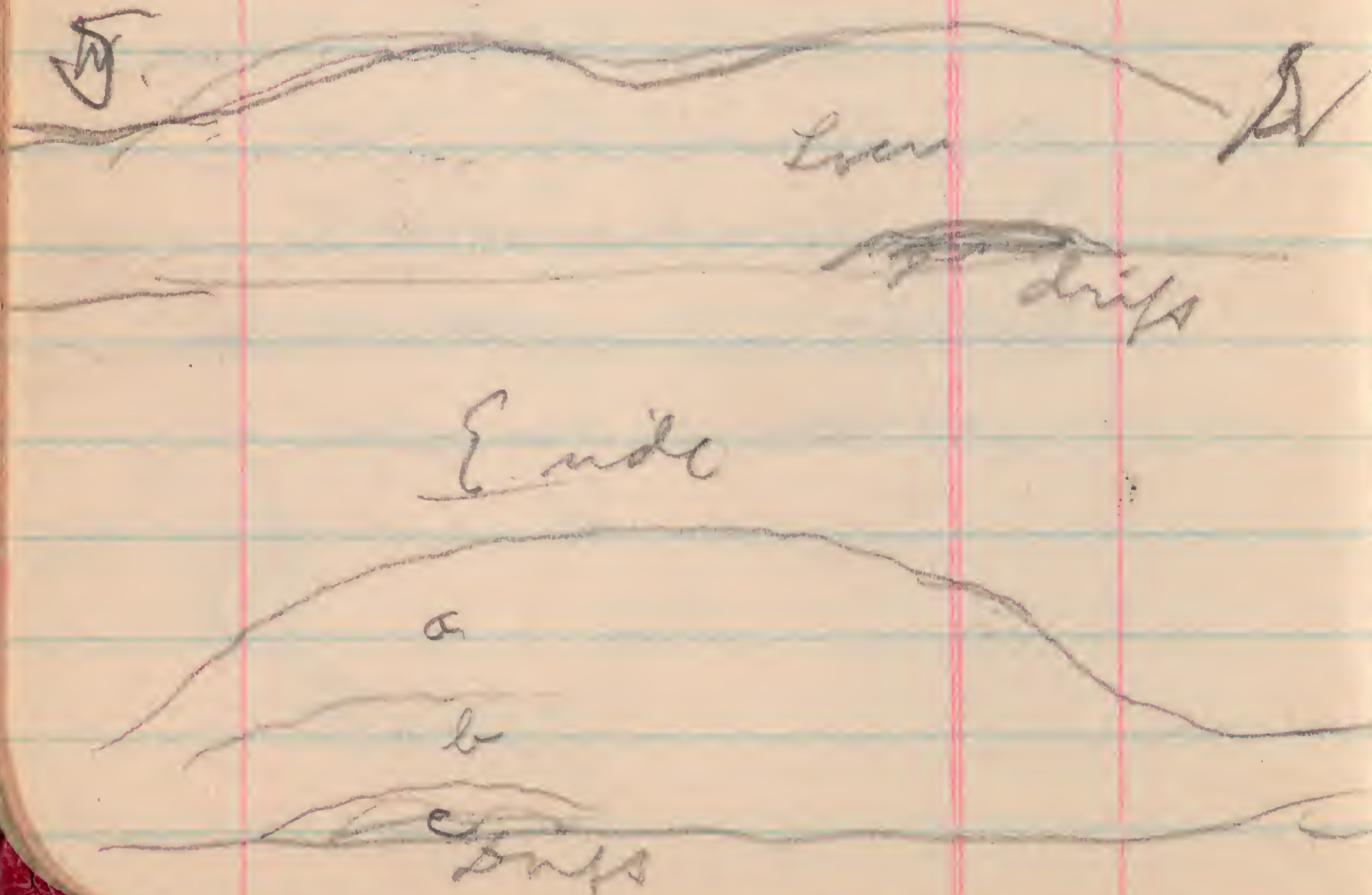
b is yellow loam.

~~Both show horizontal~~



Going N.E. from  
Glenwood -  
1<sup>st</sup> big ant. pit  
SE from Glenwood  
(The house is 100 yds  
N.E. of N.E. end of  
cut.)  
Cut about 60 ft  
deep.

W. side



a = loess - fine fragments  
of fossils, some nodules  
showing laminations  
when broken. It is  
darker (brown) than  
normal loess.  
Gravel? below it  
b. which is darker &  
like my lower loess  
in Horse creek exp  
this was about 6-10 ft.  
c. drift with some  
medium sized  
mostly Sioux & boulders  
(b) is gravelly & somewhat  
& feels more like  
joint clay below



The drift shows only  
 in W. 1/2 or less of  
 the cut. & about 7  
 ft is exposed at deepest.  
 A line of boulders  
 partly marks upper  
 part on W. side cut.  
 A great many  
 irregular lime nodules  
 show in drift on  
 E. side, not quite  
 to its top.

The loam is thick  
 & new surface (a  
 few ft.) again  
 shows redder.

The 2<sup>nd</sup> cut (smaller) is  
 about 15 ft deep &  
 of yellow loam, except  
 slightly reddish material  
 a few lime nodules.  
 Shells scattered more  
 or less, but chiefly  
 in lower third  
 of cut, except at  
 end.

Another smaller cut  
 shows yellow loam  
 nodules & a few  
 fragments of shells.  
 The larger cut before  
 coming to cross road  
 shows deep yellow  
 loam, lime & nodules  
 & few fragments of  
 shells (Succinea) &



The 2<sup>nd</sup> cut SW. of  
Balfour is 15  
ft deep.

Upper 2-3 ft. is  
yellow loess, with  
moderate fossils.  
It changes below  
not very abruptly  
into bluish  
loess, with many  
iron bands in  
upper part &  
almost blue in  
lower (a light gray,  
usual Kansan).

The yellow loess &  
blue loess both  
have nodules.  
Fossils are rather  
abundant.

in yellow loess &  
a few fragments  
seemingly big fossils  
were seen in lower  
blue loess (its  
upper streaked part)

✓ 18-15 big cut W. of  
Balfour

✓ 23 - Big cut ? Balfour

✓ 24 - " " " " N. side

	Remains - some ft
85 ft	Loess
	<del>oxidized iron</del>
	1-3 ft
	Red loess?
	on S. side blue & chocolate joint
	clay show - blue
	1 ft or less - chocolate w. red.



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Strike big out

15

1/3

Soil & loess yellow 5/11  
Blue loess 5-16/17  
Chocolate loess <sup>marked</sup> 5-16/17  
exp. 5-16/17

1/3

Red loess (?)  
Lalun

1/3

—  
—  
—



Two small cuts  
beyond B alford  
showed loess with  
many nodules.  
Another larger cut.  
Two more big cuts,  
one very large -  
The latter shows  
red loess underneath -  
Several ft. to 10 ft.  
a small cut beyond  
road shows large  
boulders. Then a  
large cut with  
loess & red loess  
exposed below.  
Another cut shows  
drifted chert, & is  
cut & does this, cut  
over 8 or 10 ft.

Then broad valley to  
Malvern.  
There is less timber  
along river. There  
was also timber in  
valleys & pockets all  
the way from  
Glennwood.

Cut opposite depot  
shows loess & several  
feet of red loess  
below.

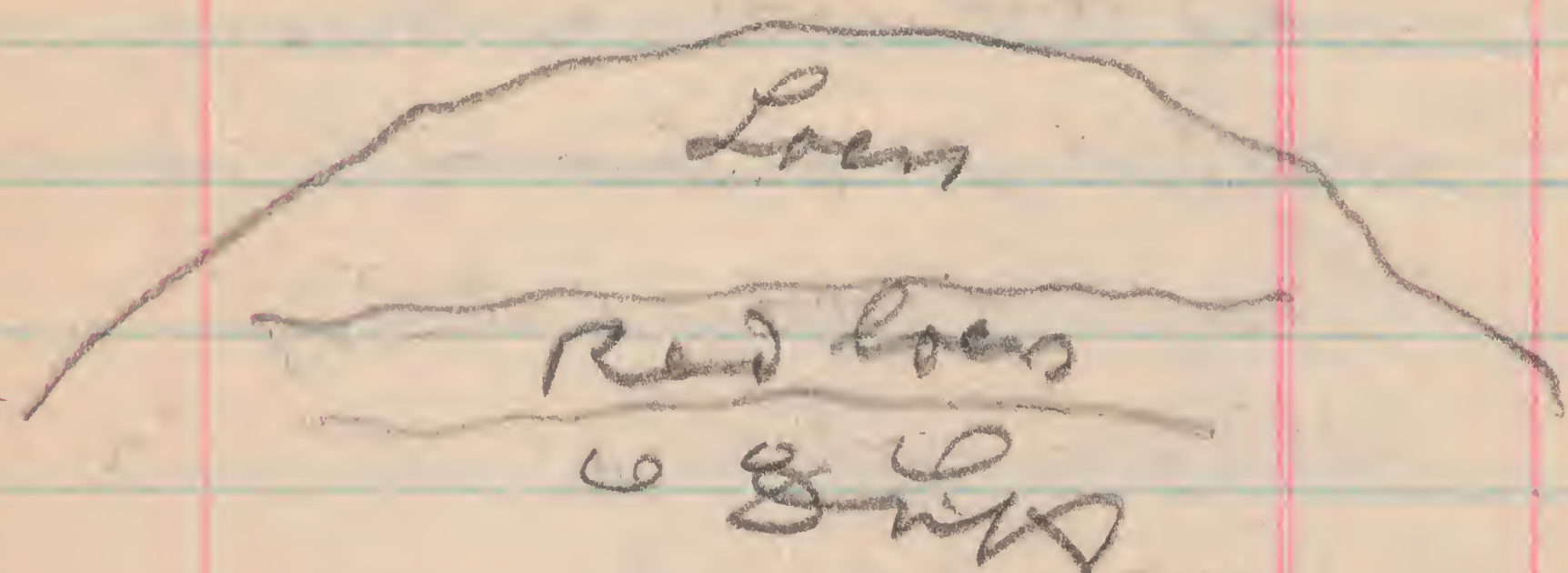
Cut is quite large.

Beyond Malvern  
the country becomes  
more greatly rolling.

Second big cut  
& shows loess, a  
strongly oxidized red  
various layers & then drift  
material.



Beyond this cut is  
a row of failed  
valleys - scrubby  
next cut (quite large)



Red loam is heavy  
drift very distinct - red  
These brown bottom  
of the Richwood  
at least 2 mi wide

No cuts to Emerson,

A cut 2 mi. beyond  
Emerson shows drift  
almost to top, then

is loam on highest  
part, but it seems  
to run out eastward.  
Next cut shows  
red drift, then  
what appears to  
be blue? loam  
& yellow loam on  
top.

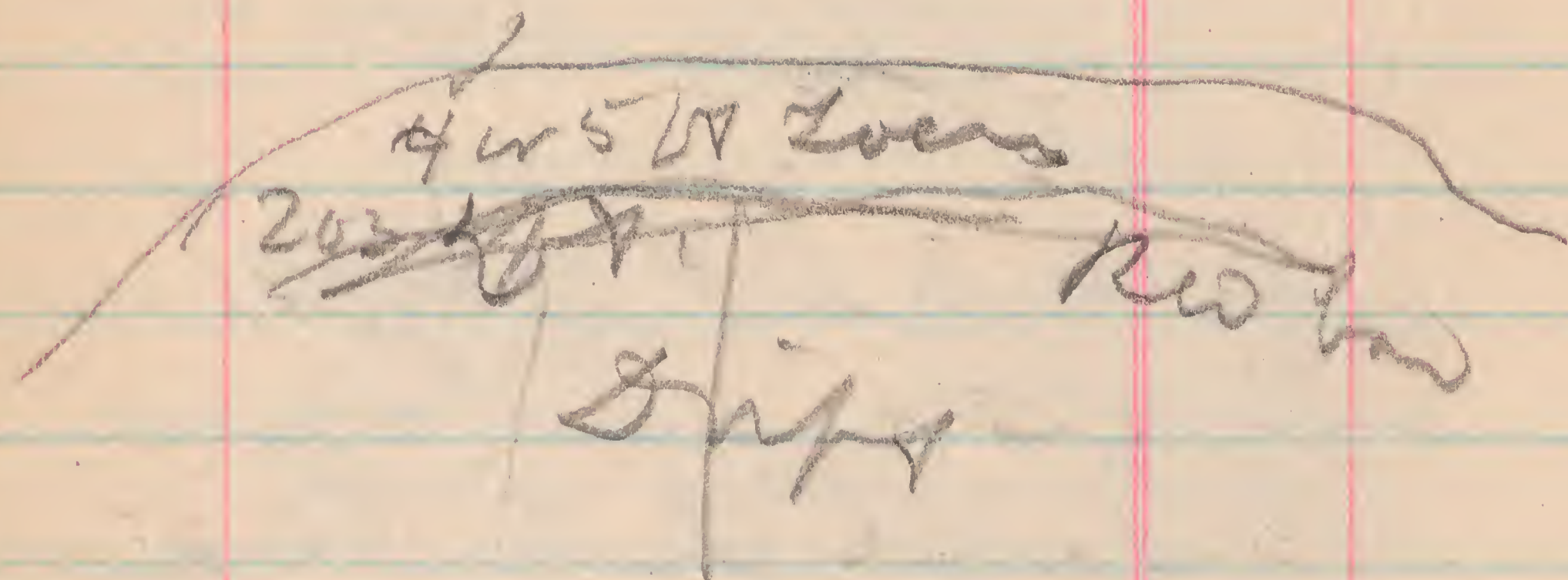
A couple of cuts  
E. show red layer  
(drift?) in lower  
half of cut &  
loam above.

This is just before  
reaching McPherson  
(west of it).

A big cut beyond McPherson  
(near depot - E. of it)  
shows drift at base &



red loess & yellow  
 loess above  
 A short distance  
 8 - yellow loess  $\frac{1}{3}$   
 Red loess -  $\frac{1}{3}$   
 Drift  $\frac{2}{3}$   
 very level



The two upper  
 layers become still  
 smaller in adjoining  
 out, East.

Red band 2 or 3 ft  
 wide & near top

Bottom land  
 where Red Oak  
 small at all  
 drift. This is  
 just after crossing  
 stream  
 near -

Loess

Red band

Drift

Still narrower, about  
 same - steeper  
 Broad bottom -



Red Oak Aug, 30-06  
cut 5. of dept.

a

b

c

d

e

f

g

h

streaked blue  
& brown

carbonaceous

Blue clay, carbonaceous

streaked blue  
& brown

brownish (almost black) like  
but with pebbles

a. the usual crumbling upper  
sandstone loam & soil -

2-3 ft upper

foot dark, - with

b. A yellow loam with  
lime nodules black  
spots & streaks, &  
horizontal iron lines  
& clardings.

This merges below, within  
1/2 a foot into c. 3-4 ft.

c. A layer of blue loam-  
like streaks of brown, -  
like old soil or humus.  
It is horizontally  
laminated & stratified  
& may compare to  
blue loam, but is  
more likely a part  
of next, belonging to



24

1-2 ft.

old drift soil.

d. an immense blue clay layer, breaking into horizontal plates, 4-6 in thick, but mixed with layers of brown (dark) carbonaceous stuff, which also form a distinct layer between c & d. 2-4 in thick. d contains charcoal. Is similar to c, or rather a continuation of d downward, with streaks of blue & brown.

d & e - 1-2 ft.

d & e contain pebbles. f. is a rather dark brown loess-like stuff, not laminated & with pebbles, some of them 1 in in diam. 1-2 ft thick

25

25

g. <sup>hy</sup> about 10 ft of yellow, brown drift with pebbles & few small boulders also lime nodules - immense. g. is simply the upper oxidized (brown) part 1 or 2 ft. thick.

With samples of b, d, & f.

c, d & e look as if laid down in water, c shading up into loess.

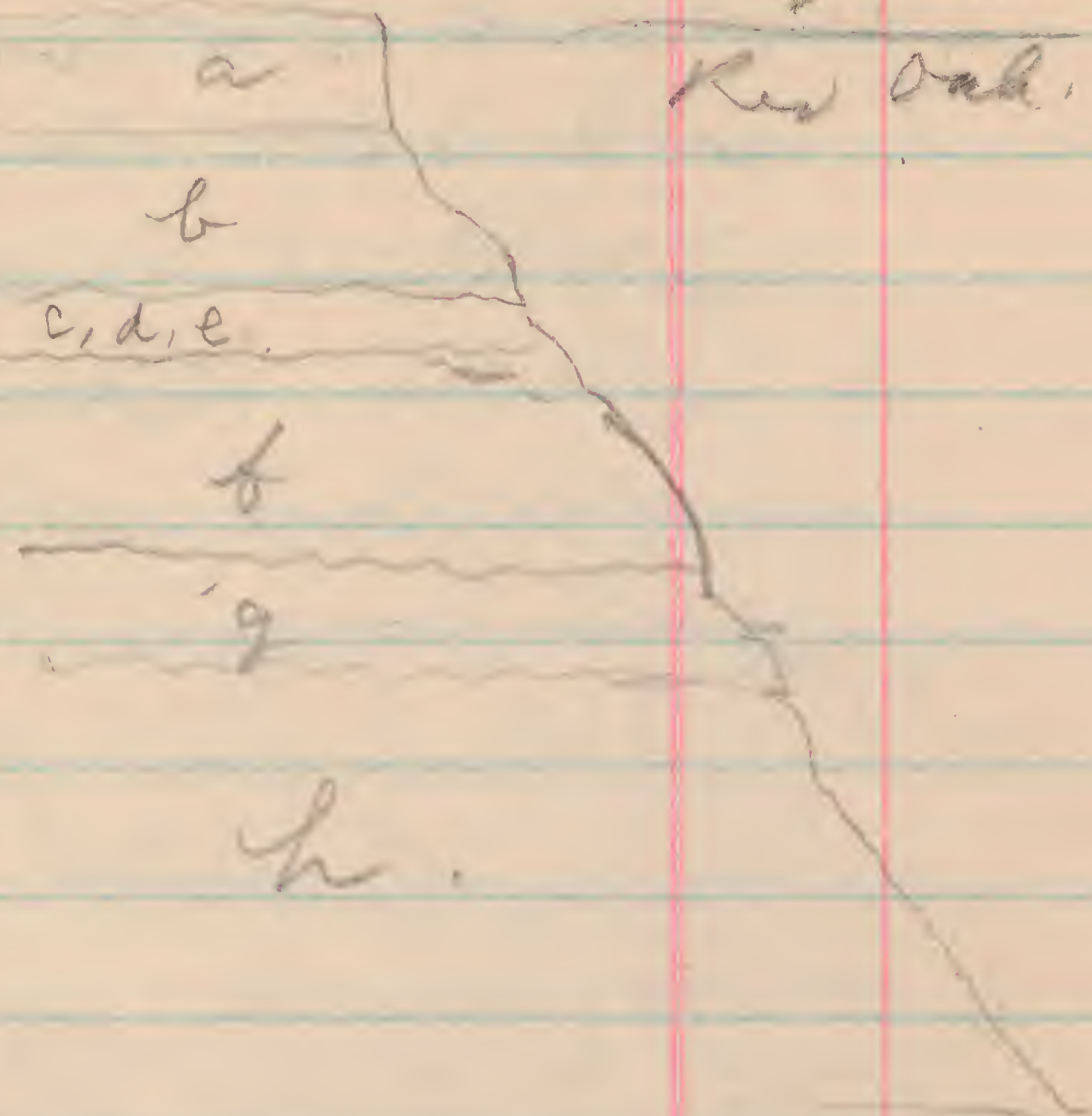


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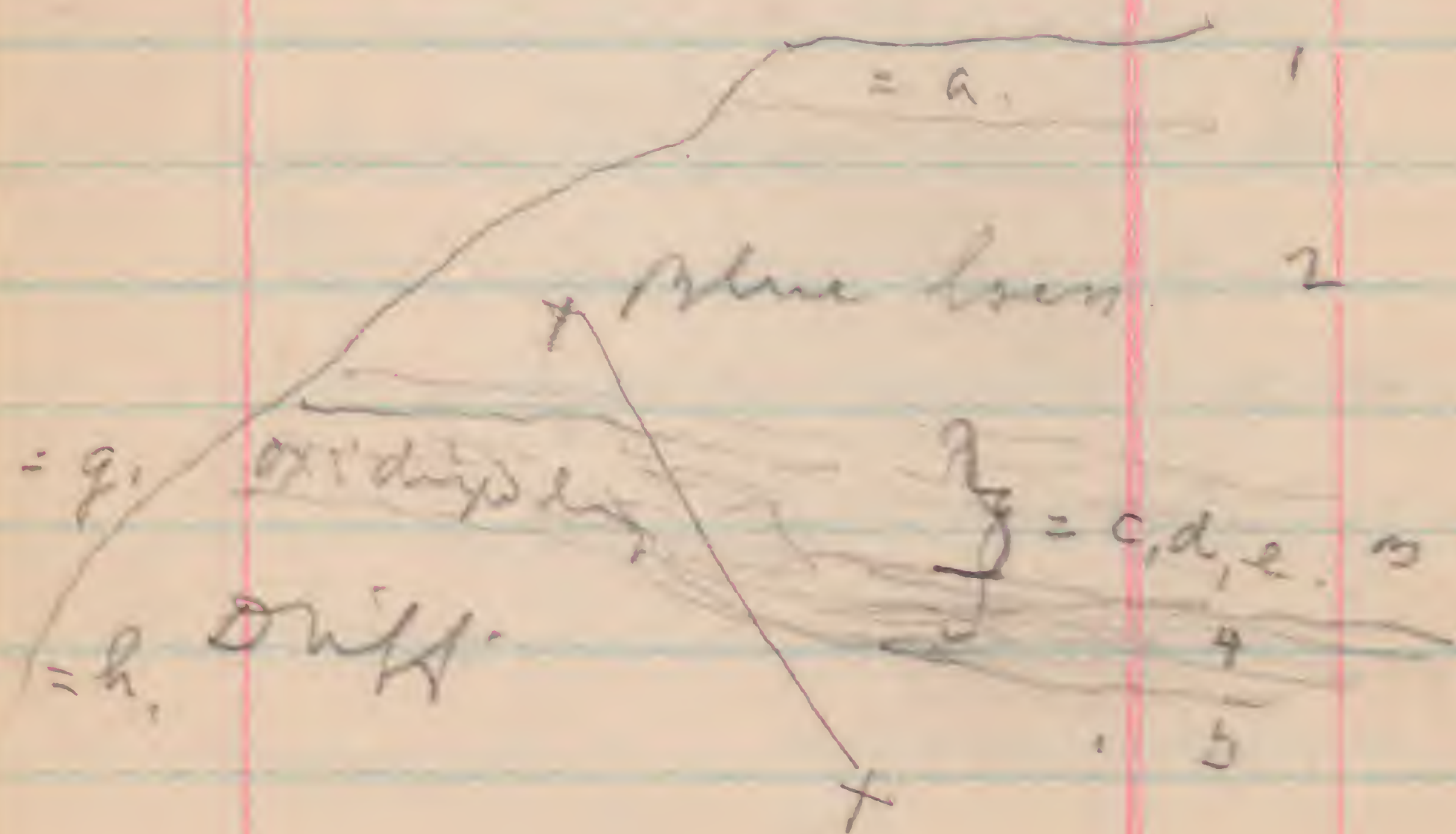
✓ R. ✓ S plates

cut. S. of depot

Res Oak.



cut. E. of depot - Res Oak.



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1- Dark soil & loose loam  
2 or 3 ft. This may  
correspond to a & b  
of 12 cut -  
It becomes reddish  
below.

2- Is blue loam - with  
iron horizontal streaks  
no fossils, no nodules  
some iron vert tubes

3- Is irregular & not  
unlike 2, but  
unstable, & shading  
horizontally into  
about along X R

It appears as if  
there had been a  
pond here, with  
XX the beach, & B  
a mud deposit.

above 2 ft. 4-5 ft.

~~4~~



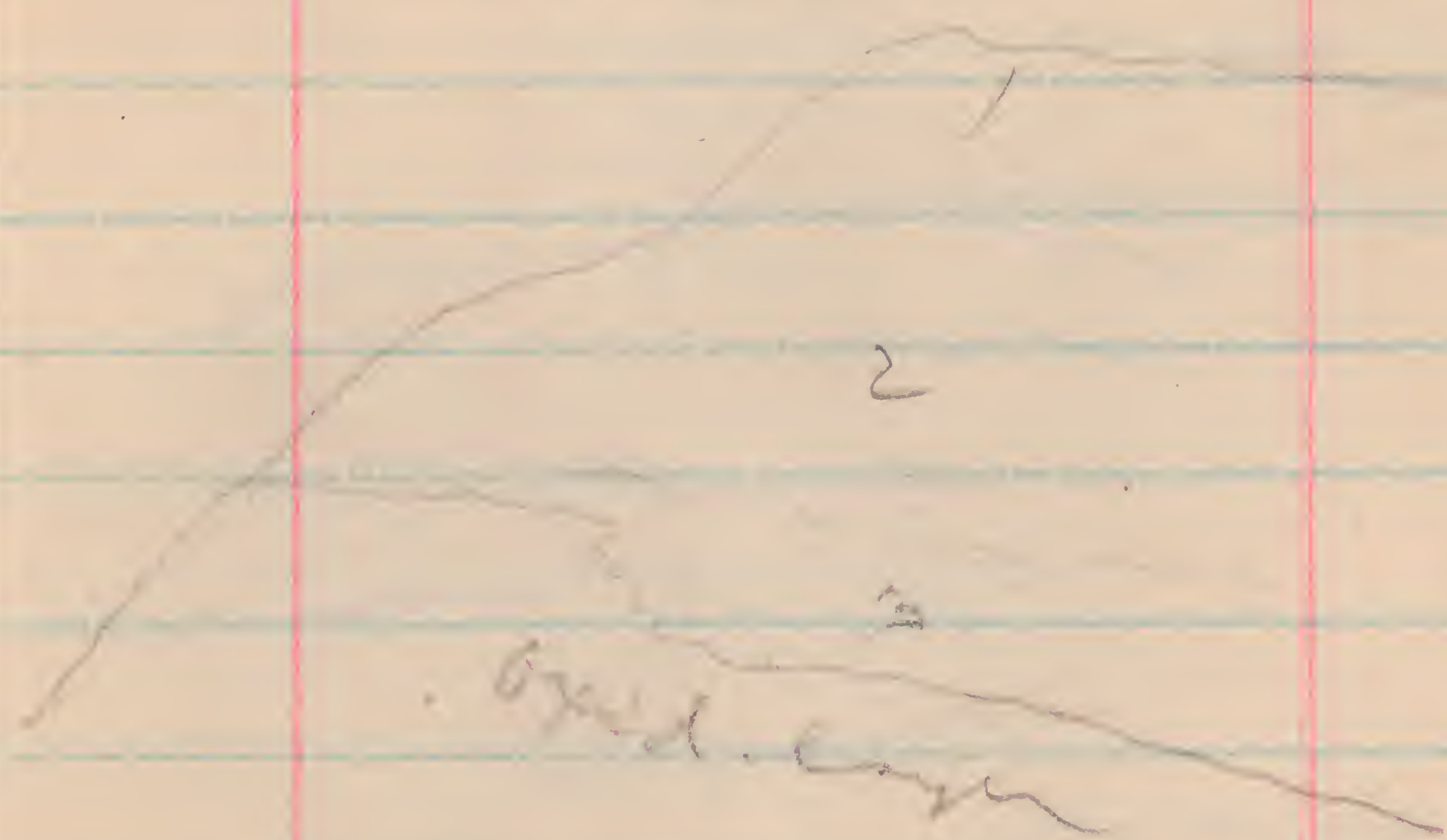
- 4 is strongly oxidized iron  
 & is 6 ft. & blunts  
 with drift. It is  
 drift, with pebbles  
 etc.  
 5. Is like drift in  
 1<sup>st</sup> cut.

Took sample of (2)  
 at about middle

- 3 has darker band, than in  
 bluish, like loam &  
 evidently corresponds  
 to C, d, c in 1<sup>st</sup>  
 cut.

This cut is toward E. end of  
 long cut, east of depot, &  
 is transverse to general  
 cut. Most of cut is overgrown

- 3 dips down decidedly  
 " was probably bottom  
 of old pond.  
 The stuff in stratified  
 The larger boulders in  
 drift are red.  
 Largest 5 or 6 in.



Plates 13 & 14 -

Ortho -  
 cut of Red Oak.



The same long cut  
 E. of depot, at West  
 end, N. side, shows  
 drift & yellow  
 loess above it & or  
 a layer like it is  
 cut S.

Return to Malvern  
 from Red Oak - 8/30-106

Beyond McPherson (Kopet)  
 Road - just beyond.  
 150 yd - cut -

Loess (looking  
 yellow)


Red tan  
 oxides.

Drift

this is a double cut.

1200 ft more  
 cut, about the  
 drift.



Road 

a hill beyond  
 a big cut  
 slumped - then  
 was about  
 100 ft below

1600 ft - small cut  
 500 " larger "

Slumped.

At 4000 ft road,  
 just before reaching  
 depot at Emerson.  
 (In each case measure  
 between cuts, &  
 length of cut not  
 taken into account.)

The wagon road runs parallel  
 to RR, from crossing to Emerson.

Beyond Emerson - to  
 Harlow no cuts  
 worth mentioning.

~~5500~~ river

5300 + 500

<sup>2nd cut</sup> 1800 + 800 +

big cut  
 even looks blind  
 & the yellow  
 red clay

+ 4  
 Road

+ 2500 to cut

1700 long cut

Depot at Harlow

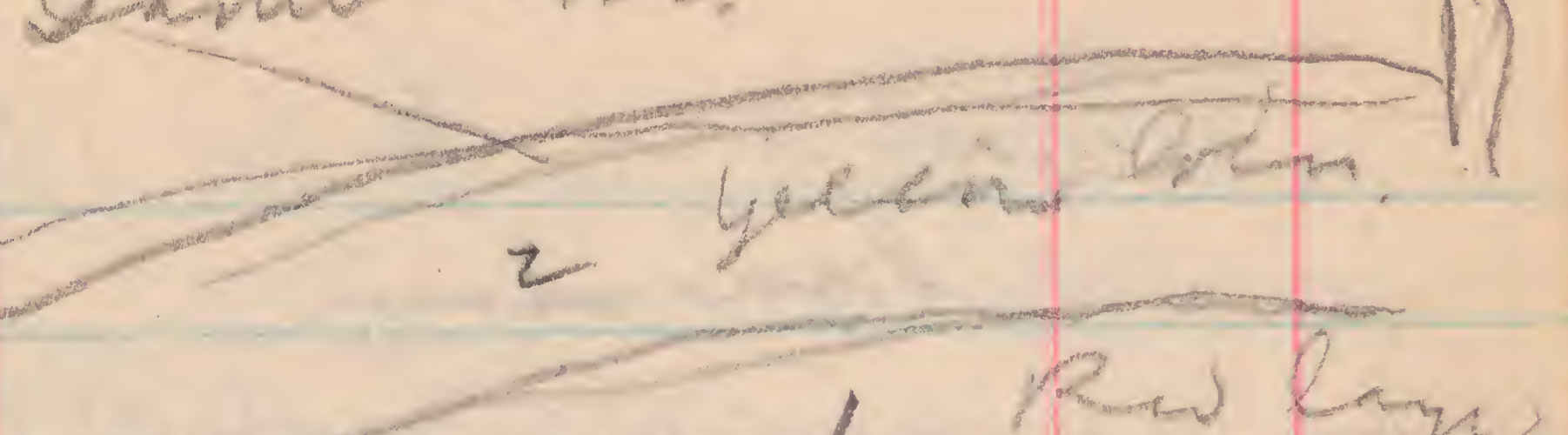


Cut sp. deposit  
at Malvern

Is highest east  
of depot.  
Below, at the  
highest place,  
there is about 10  
ft of red loam &  
15 ft. of yellow  
loam - latter  
like C in cut  
S. of depot at  
Red Oak.

Toward west the  
red layer becomes  
more like joint  
clay & thin grains  
of sand can be  
seen.

Took samples of soils

overhead 35  
under above.  


Took samples of 1 & 2

The loess thin out  
westward somewhat  
It contains a few  
round nodules.  
The line is ~~not~~  
sharp between 1 &  
2, but change  
is abrupt.



Malvern &  
 Shenandoah -  
 per Wabash R.R.  
 Beyond Malvern there  
 is a big cut, but  
 overgrown.  
 Smaller cuts beyond  
 Strahan show drift.  
 Mostly overgrown.  
 There seems to be  
 loess on top in most  
 of them.  
 Some miles out  
 there is a big loess  
 cut, - nodules.  
 Another rather large  
 one is a short distance  
 beyond and near  
 Solomon.

Just beyond Station  
 a large cut shows  
 loess & lower part  
 has red stuff.  
 Good sign and beyond  
 Quigley street  
 same - loess etc.



Road from Summit  
to Hamburg.  
at 1. Red uppermost  
layer of drifts, rounded  
loamy above comes  
almost to surface  
there is a little  
loamy soil above  
it. Gravel  
appears in shallow  
cuts in ditches

Looked for shells (recent)  
at (2) in a grove of  
Cucumber, Squash  
& elm. but  
found none.  
2 is rather low, but not  
subject to overflow.

A 3 collected below  
on old fence  
at 4. Blue loam is  
exposed on lower part  
of slope W. of creek  
(streamlet) to road.  
Near top of hill there  
is a bluish yellow  
loam on top of  
blue loam.  
at 5. top of hill -  
blue loam comes  
to top - saw  
nothing else  
at 6 almost no yellow  
loam - blue loam  
exposed -



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Reached Hamburg 7<sup>15</sup> PM.

Put up at Julian Hotel

Aug. 31 1906

Left for Nebraska City

at 8<sup>15</sup> AM.

Put up at Watson Hotel.

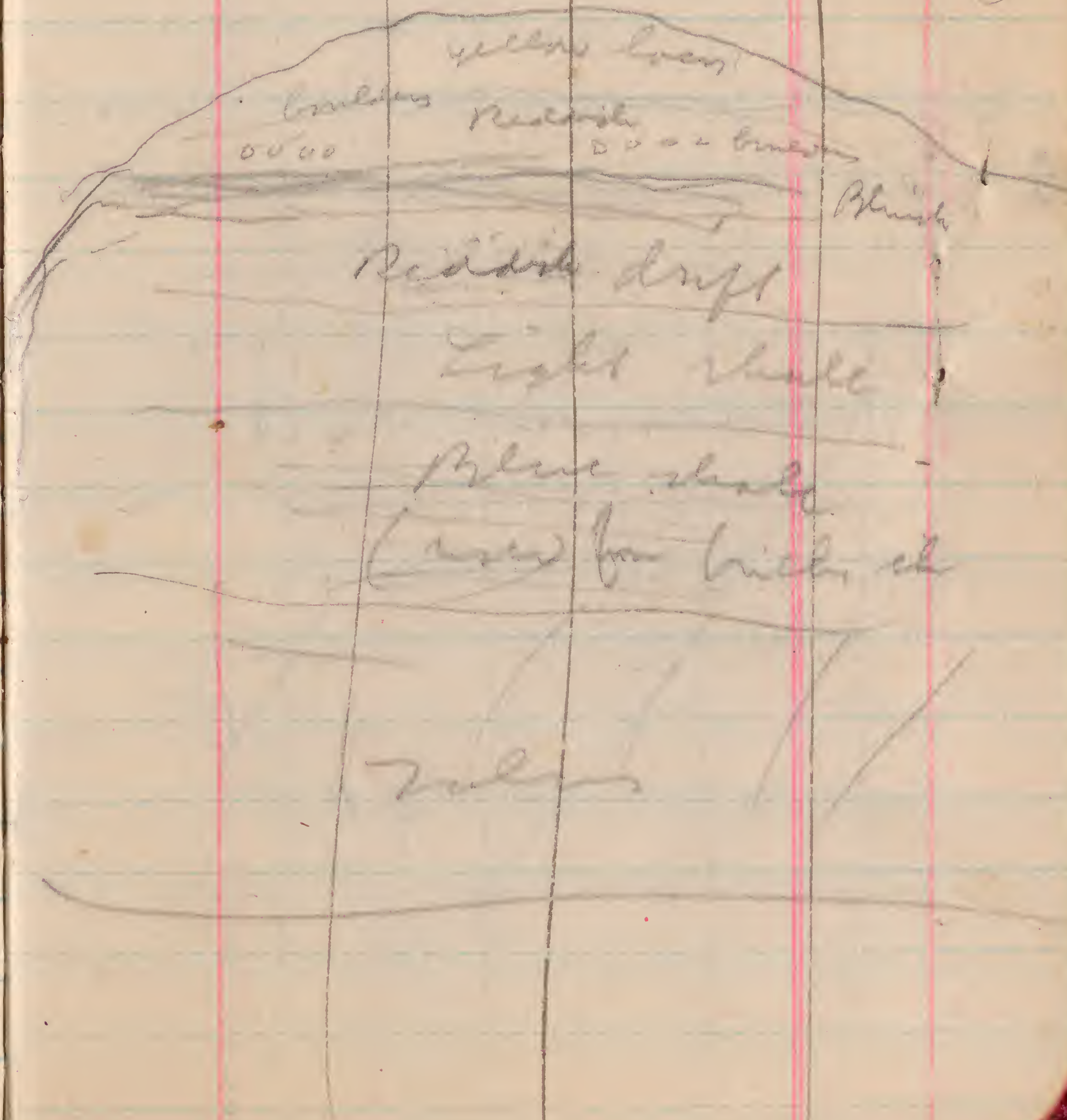
1.

Cut 1. At cor. Main & Center Ave,  
E. side of Center Ave &  
S. of Main. The street  
cuts about ~~20~~ 7 ft  
into light yellow loess  
with fine nodules, is somewhat  
in lines & not too of shells.

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3.

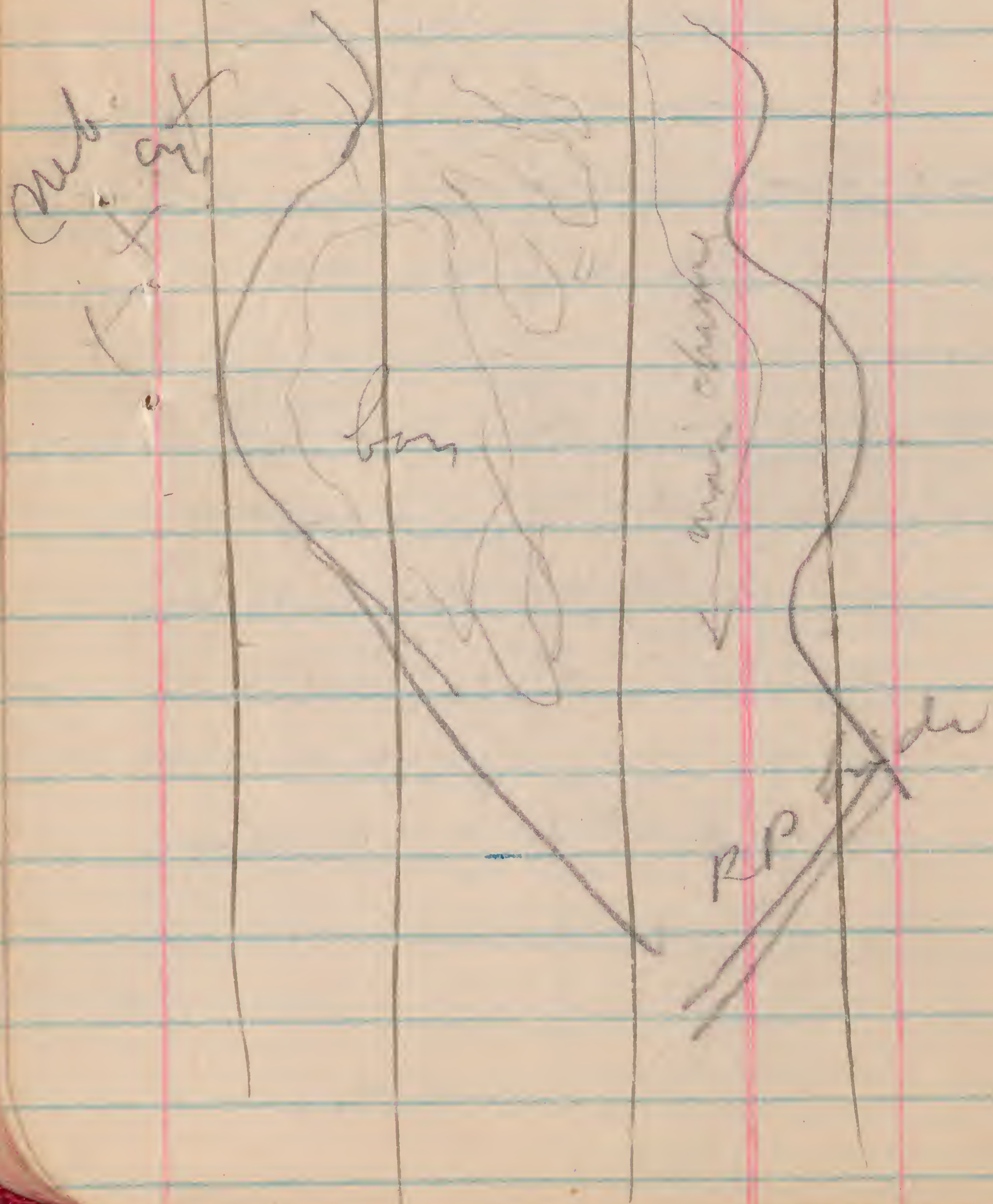
Cut 2. Below RR bridge bluff where  
brick co. gets shale etc.  
As nearly as I could make  
out from below, (top  
of section is in rubble).





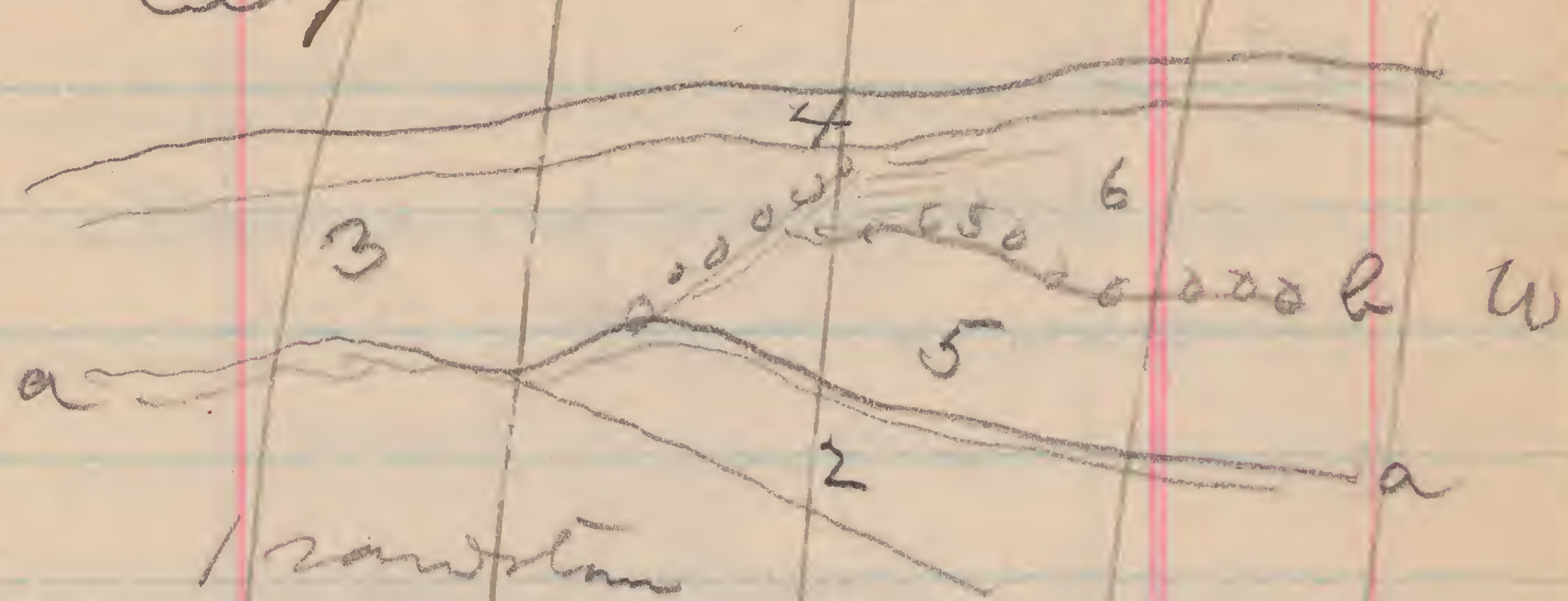
42

✓ Views looking up river  
 ✓ on Neb. Co. side from  
 near S. end of cross  
 RR. bridge.  
 shows base



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2  
 cut 2 = carbon cut



1. Coarse arenaceous shale
2. Fine grained light color normal loess.
3. Normal loess.  
 Line on very definite
4. Normal medium loess
5. Obviously stratified loess with bands of pebbles etc.
6. Normal loess blending with 4 at west end



4. Is a small yellow  
"lobular" loam, & is  
about 4 ft  
line between 3 & 4 is  
not sharp.

3. Is a blue loam with  
large iron tubes which  
extend also into shale  
below. The upper  
part near 4 is darker  
color.  
The line between 3 & 1  
to left is sharp.  
Lower part of 3 breaks  
into vertical plates  
nearly parallel to face  
of bluff, just like 1.  
Is this due to shelling?  
It contains charcoal

rocks & a few lime  
nodules. No fossils.  
The root tubes are  
vertical, & I trace  
some through 3 & 1.  
4 runs below into a  
much chocolate color  
layer 1 ft thick.

as in many places has  
limestone plates, also  
red, iron band,

The lower part of 4 is  
certainly not loam  
& upper part may  
or may not be.  
It all crumbles  
into angular pieces.

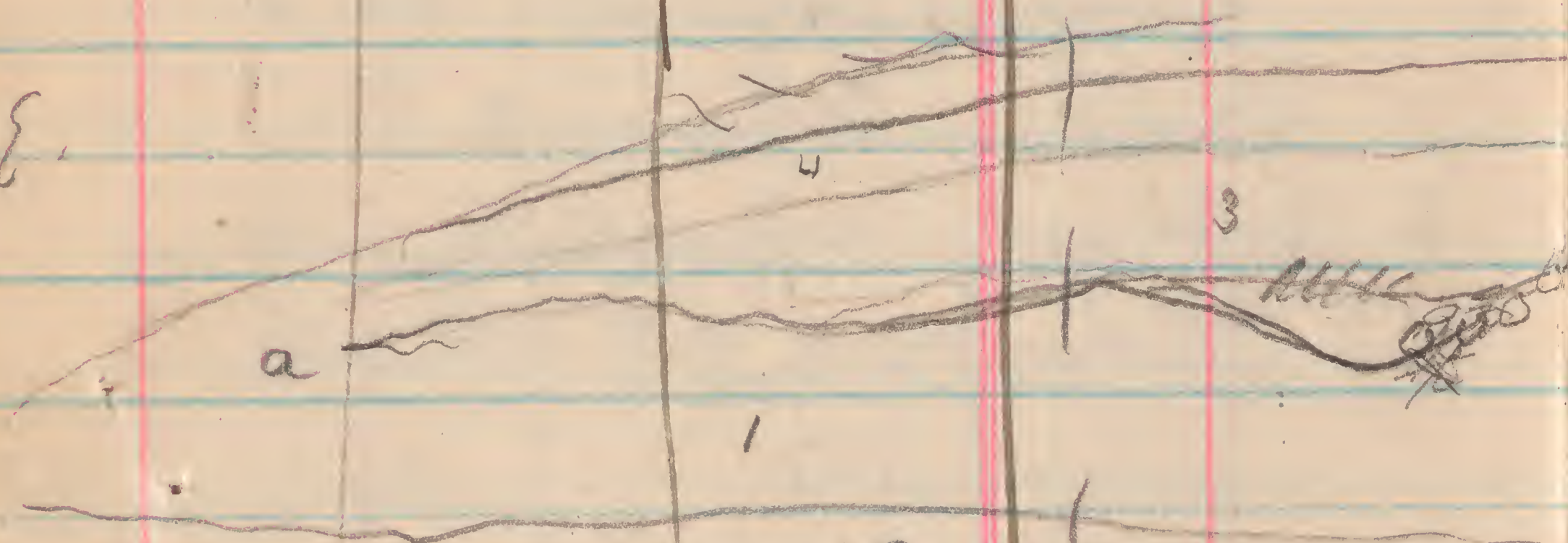


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1 looks to me more like  
old glacial mud.

X

8.

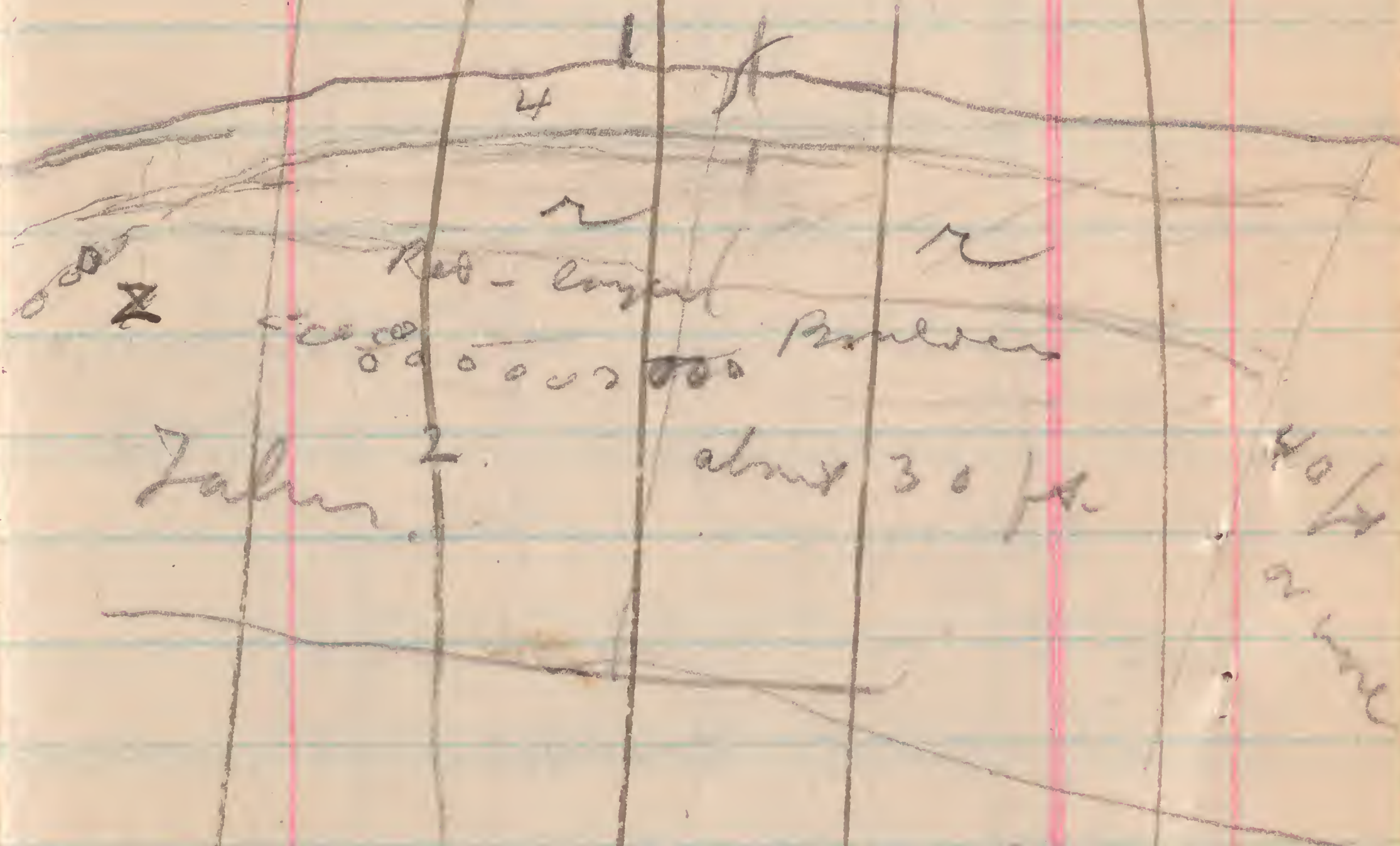


RR!  
to Mesquite Cy-

To right of <sup>2</sup>X there is  
a red layer, hard &  
mucky with some pebbles  
below & sandy somewhat.  
Could not get exact thickness  
but there is at least  
3 or 4 ft. This is  
like lower part of

47

19



Willcox's red loess,  
is drift.  
The boulders are in  
lower layers, as  
if dropped from  
floating ice.  
Some are dark (blackish green).  
Some are red. Many angular.  
1-6 in in size & a few larger.



48

✓ Photo. A. taken in  
X-7 of Calumet

✓ B. gives view of whole  
cut, with columns  
roots run down 20 ft &  
are still large.

Calumet part of cut  
is far part among  
trees

As on preceding page it  
is compact yellow  
(blue streaked) loam,  
with some nodules,  
no gravel.

49

I took sample at  
W. end of exposure  
from this. It  
shows up from  
"red loam"

4  
cut 4

just north of M. & P. RR  
depot there is a bank  
about 15 ft. high of  
which over a half  
is "red loam" & the  
other part is yellow  
fossiliferous loam.

It contains a few  
rounded nodules.

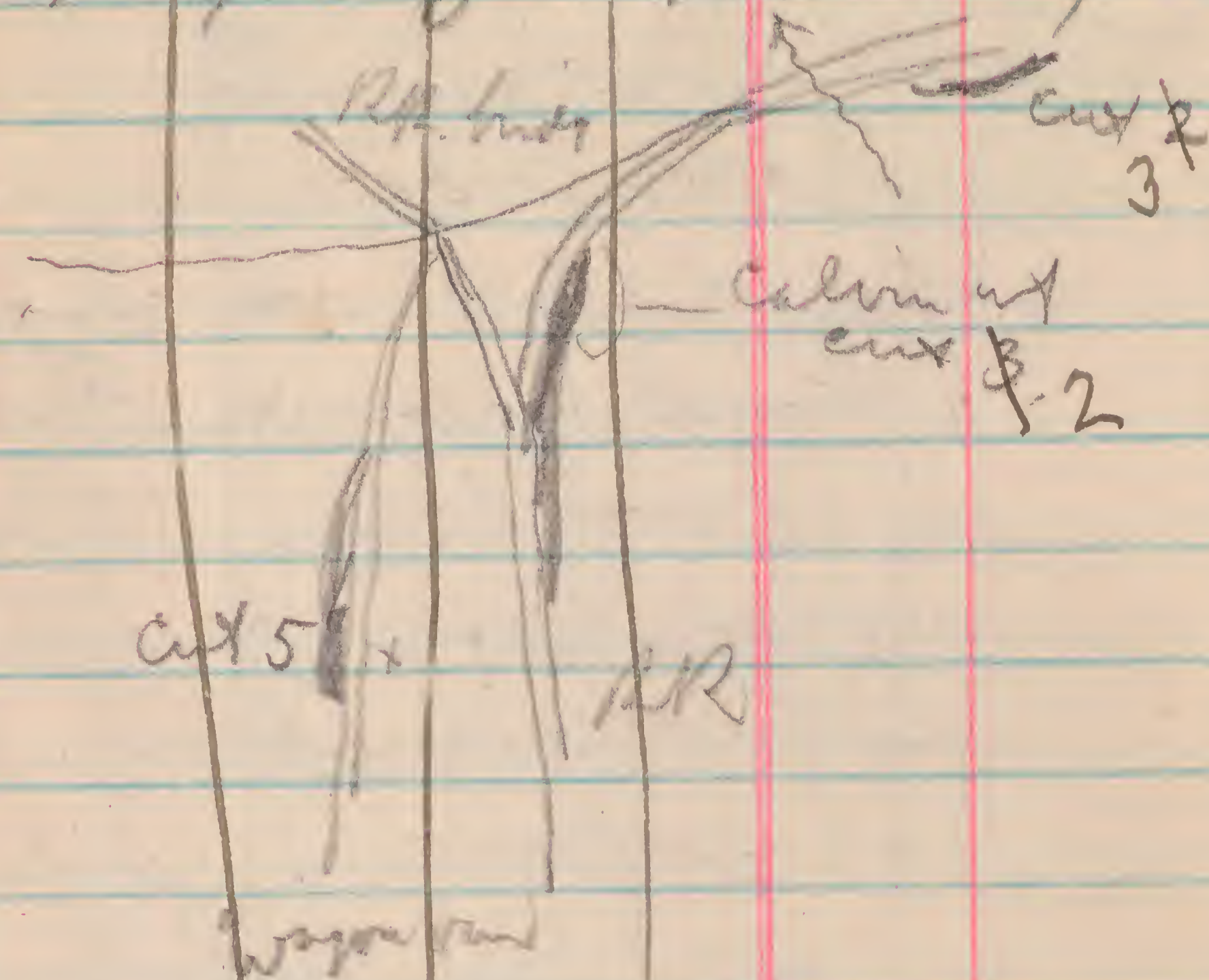
It is typical yellow  
loam with a few  
horizontal iron streaks  
& occasional black spots



V 50

See shells & samples,  
fossils seem to be most  
abundant in the lower  
half.

This cut faces the  
Minnesota river, which is  
only a few rods away



51

5

cut 5 is about on level  
with RR near & extending  
to top of hill.  
About half way up the  
hill yellow loam (pale)  
streaked with blue,  
with a few nodules  
& a few shells.

See above.

It is like that in cut  
4, but is more strongly  
laminated.  
The shelly part  
is at lower end  
(near town)



was shocked to hear  
of Mr. Rosewater's  
death.

I called on him only  
last Sunday. He  
appears tired, but  
is all right.

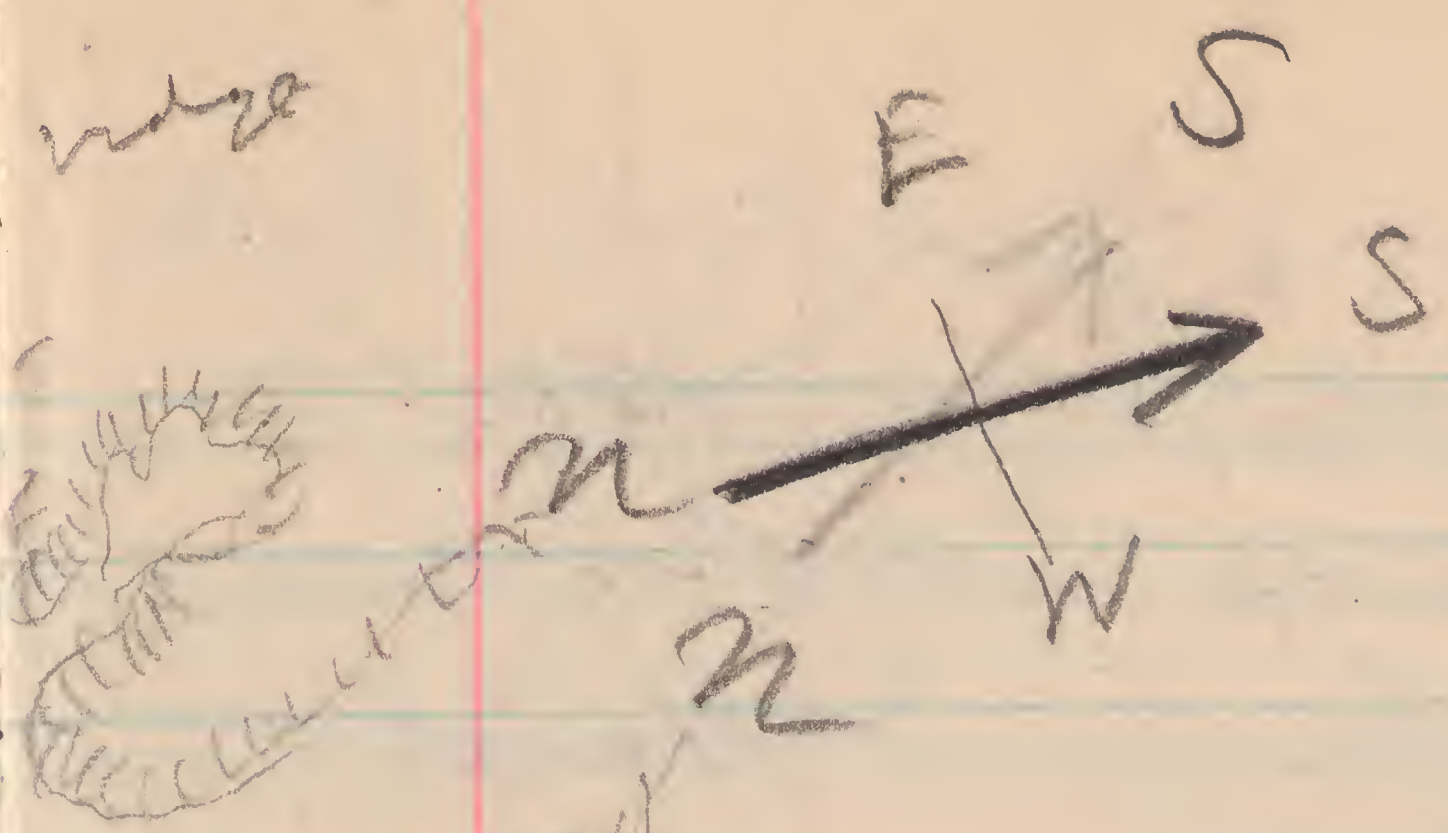
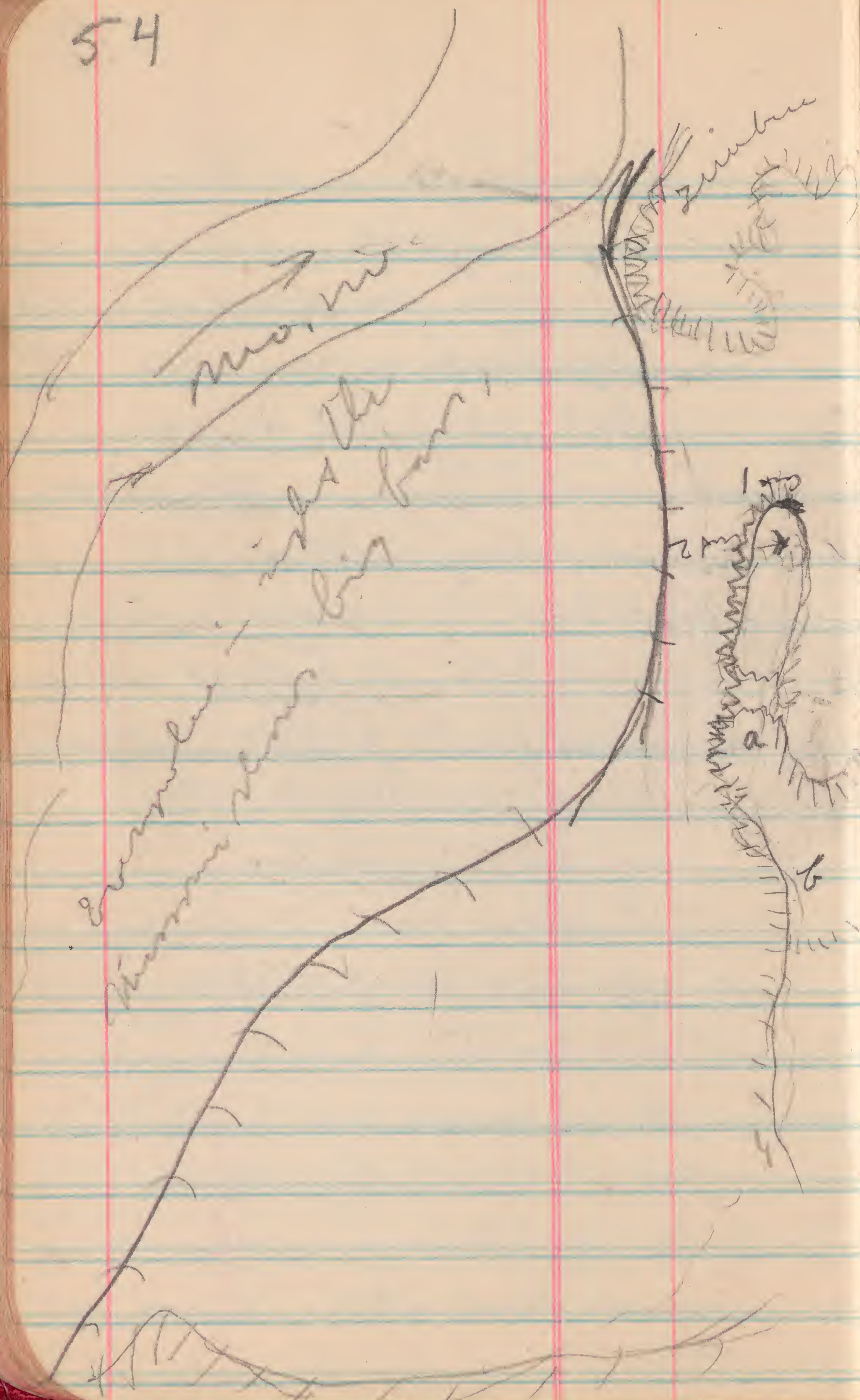
Sep. 1 - 1906  
Started for Perm at  
8:45 am.

The 1<sup>st</sup> cut in Perm is  
a block 3, or 4 blk. W.  
of depot. It is at base  
(end) of ridge on N.  
side of road. It  
appears like a darkish  
soil. Has nodules &  
some shells, mostly Helicostoma.

Several were obtained  
by digging  
See samples.

Also took a sample  
from near top of same  
ridge, - ft. above  
valley. This is  
Cut 2 - a small exposure  
near end of top of ridge  
in fine light yellow  
powdery loam with  
a few nodules.  
I also saw a few  
fragments of shells.





The ridge (cuts 1+2) reminds one of the Hauling ridge but is not as high nor rugged.

There is no black soil on this ridge, - nor in any of similar ridges elsewhere.



Woody plants on bluffs  
at River Mouth

Cottonwood	Box Elder
Sycamore	Hazel
Ambrosia artemisiifolia	Basswood
Bitterroot	Osage
Cornus canadensis	Wild Grape
Burnsack	Catalpa
Honey Locust	River Elm
Quercus velutina	
Salix humilis (rough)	
Bitterroot	
Wild Plum	

Salix amygdaloides  
& longitarsis

on lower ground

walnut an elm  
mulberry soft maple  
willow (acorn or nutmeg)  
a cottonwood grove on flat NW  
of depot shows many dead trees in cut  
of grove.

The slopes facing the  
main valley are all very  
abrupt, as if the river  
had recently been  
undermining.

On the higher part of the  
ridge, at (as I found)  
a heap of coarse sand  
& gravel. Used in  
making of a small  
water reservoir on  
ridge.

Suppose this is  
discontinuation?  
It is quite windy today  
(wind E. of S.) &  
although it has recently  
rained (yesterday) there is  
much dust in the air.



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Perm. 9/1206

X Photo 23 - Looking S.E.

down river from top of

1-27-28

✓ 24 - Looking SW. into  
an inner timbered valley.

The ridge at highest part  
is about 130 ft. above  
R.R. on bottom.

cut 2 is about 170 ft  
and cut 1 (at base) about  
2 ft above RR. It  
is about 8-9 ft deep.

Box 3 is 2 block S of  
depot, goes way up  
hill. Its base is about  
30 ft. above the RR  
depot.

cut 3

59

M. Sieb.

$$a = 6 - 7 \quad b \checkmark$$

~~6 124~~

77A.

12 in

at 8 min

8 in to 1 ft

e — 2.58. +

8 - 2 P. ex pona  
Zaluz

a = light yellow locus -

b = iron band rather sharp  
 & about 1/8" cross, in  
 places a mass of laminated  
 band.

c - blue loam - with



large iron tubules, some  
of which pass through to  
into c. They are  
especially abundant  
in the lower half.

c is about 7 ft. deep  
It is scantily fossiliferous  
in upper part. The  
shell being very  
fragile.

d is a dark chocolate  
layer like that observed  
below blue mud in  
Calvin's exposure.  
The iron tubules run  
into it.

e is a very red clay  
& gravelly layer &

f is dark blue black gravel  
darker

The same structure shown  
to right for 100 ft  
along shoreline (not  
Can the dry pit)  
and 3



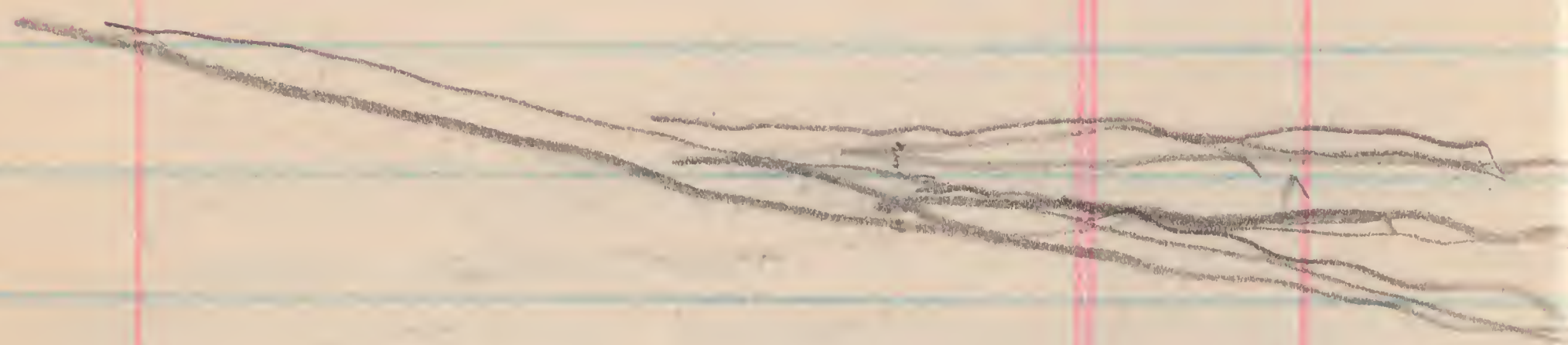
a shows from to horizon  
right - to end of  
reef

Two samples of  
c - 1 ft. + below top &  
1 ft. above bottom

a -

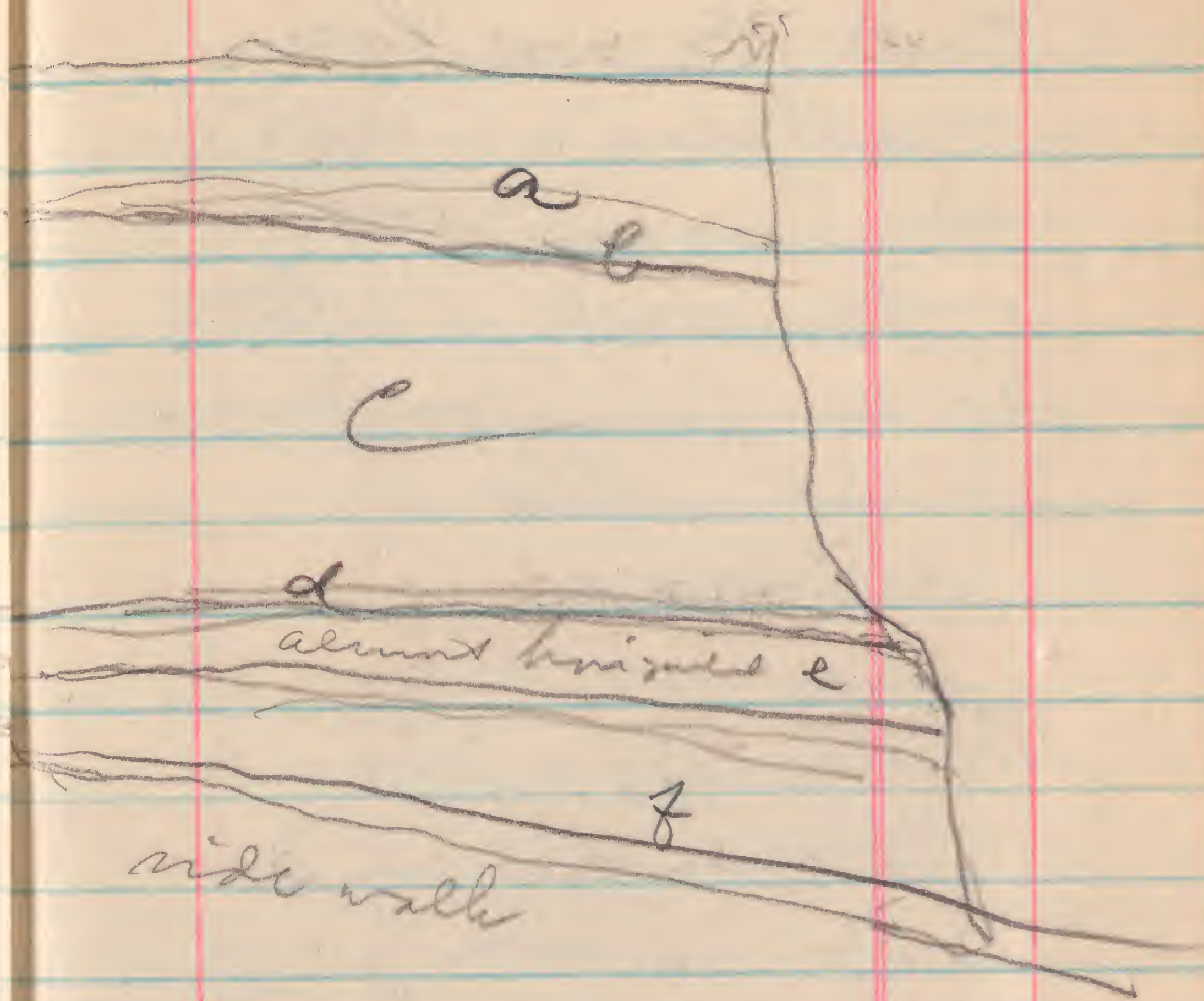


Cut 3 - E. side.



d + e are almost  
horizontal, if  
anything dipping back.  
They are exposed for  
over 50 ft.  
a thin out to left

d is joint clay - like water  
sand stuff - bluish shaly  
above & with brown iron



below - a sort of chocolate



c. contain ~~some~~  
nodules - not rare  
a has a few  
fragments of shells.  
I recognized Menden  
mud., but it  
crumbled.

✓ Photos 31 & 32

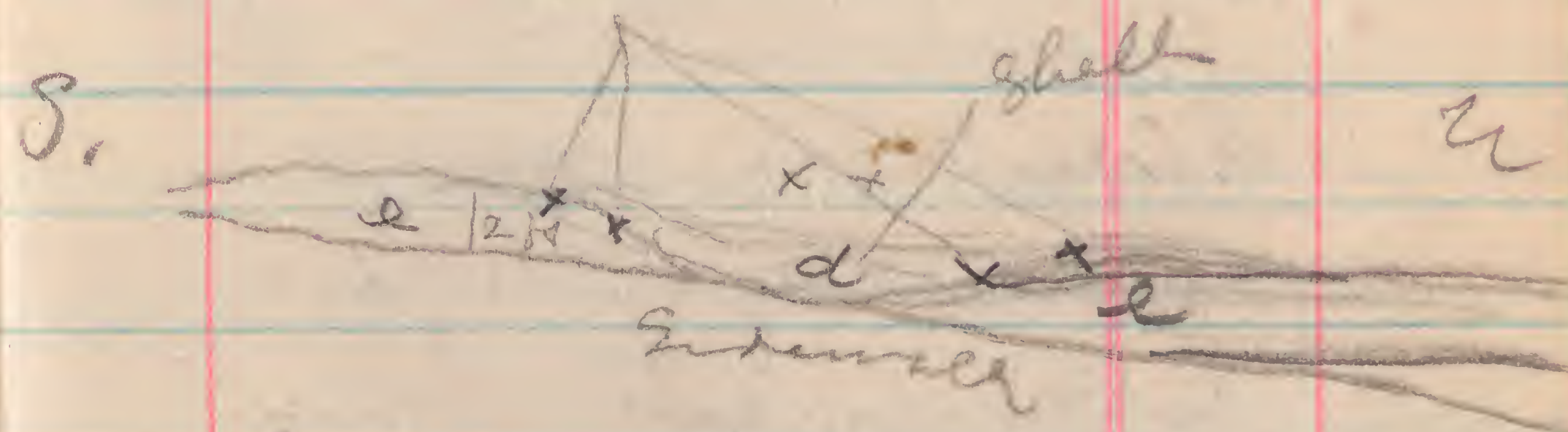
N. side of cut 3.

✓ 13 & 14 - E. side of cut 3

On E. side, toward S end  
of cut 3, the layer  
(d) is thicker, its part  
is larger, with yellow &  
light blue. This,  
however, is muddy.  
In this upper part I  
found several fragments

of shells & a few whole  
ones. Pyram. altissima  
↓ Helium ornith.

This is in a little  
depression of the  
red layer & ✓  
marked - photos 17 & 18 ✓



Just above d the  
fragments of shells  
appear throughout.  
The blue layer even  
to base, & blend  
with d.

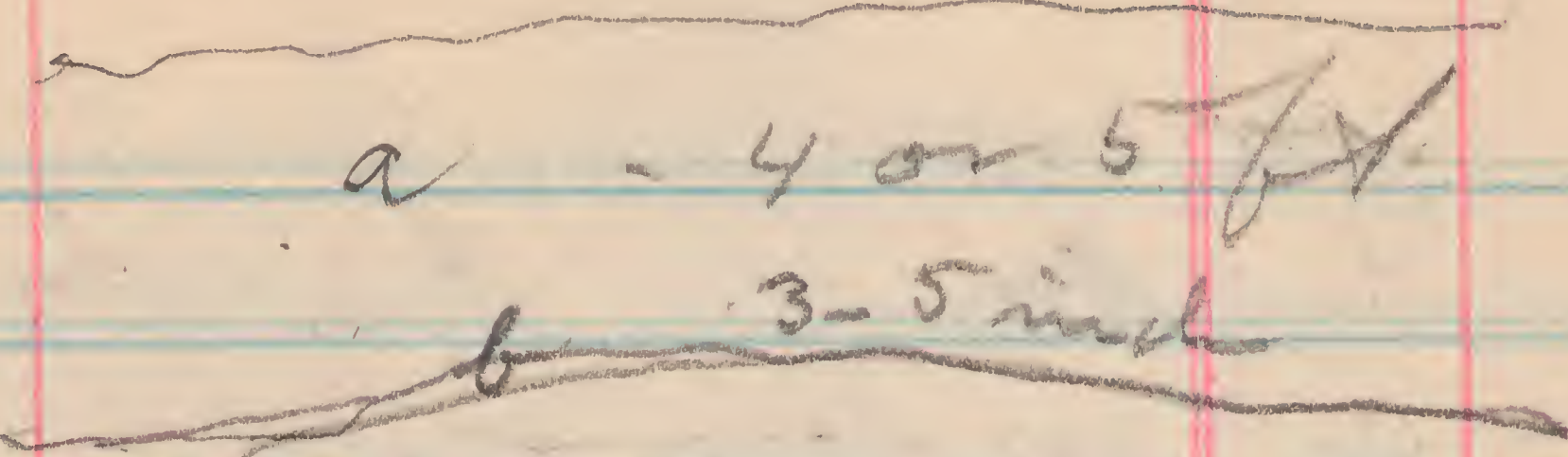


$\frac{90}{45} = 2$   
 $\frac{105}{2}$

Cut 4  
 4 blocks S. & 1 block  
 W. from depot.  
 Run up hill from  
 main str. town  
 W. Fossils very  
 plentiful in a  
 yellow loam, often  
 horizontally lined &  
 banded with iron.  
 On S. side of str.  
 more uniform &  
 some of it darkish,  
 like soil

This is halfway up  
 the hill & its top is  
 about 20 ft above  
 street.

cut 4



$C_1$   
 $C$  about 6 ft  
 $C_2$   
loam  
 a - A loam, slightly  
 brownish, with black  
 spots. Same as found  
 b - is a hard iron  
 crust with iron  
 rust tubes projecting  
 below, also as hard  
 as iron  
 $C$  Loess - the upper part  
 ( $C_1$ ) is nicely banded &  
 lined with iron, &



is especially fossiliferous.  
The lower is darker  
& contains some  
fossils.

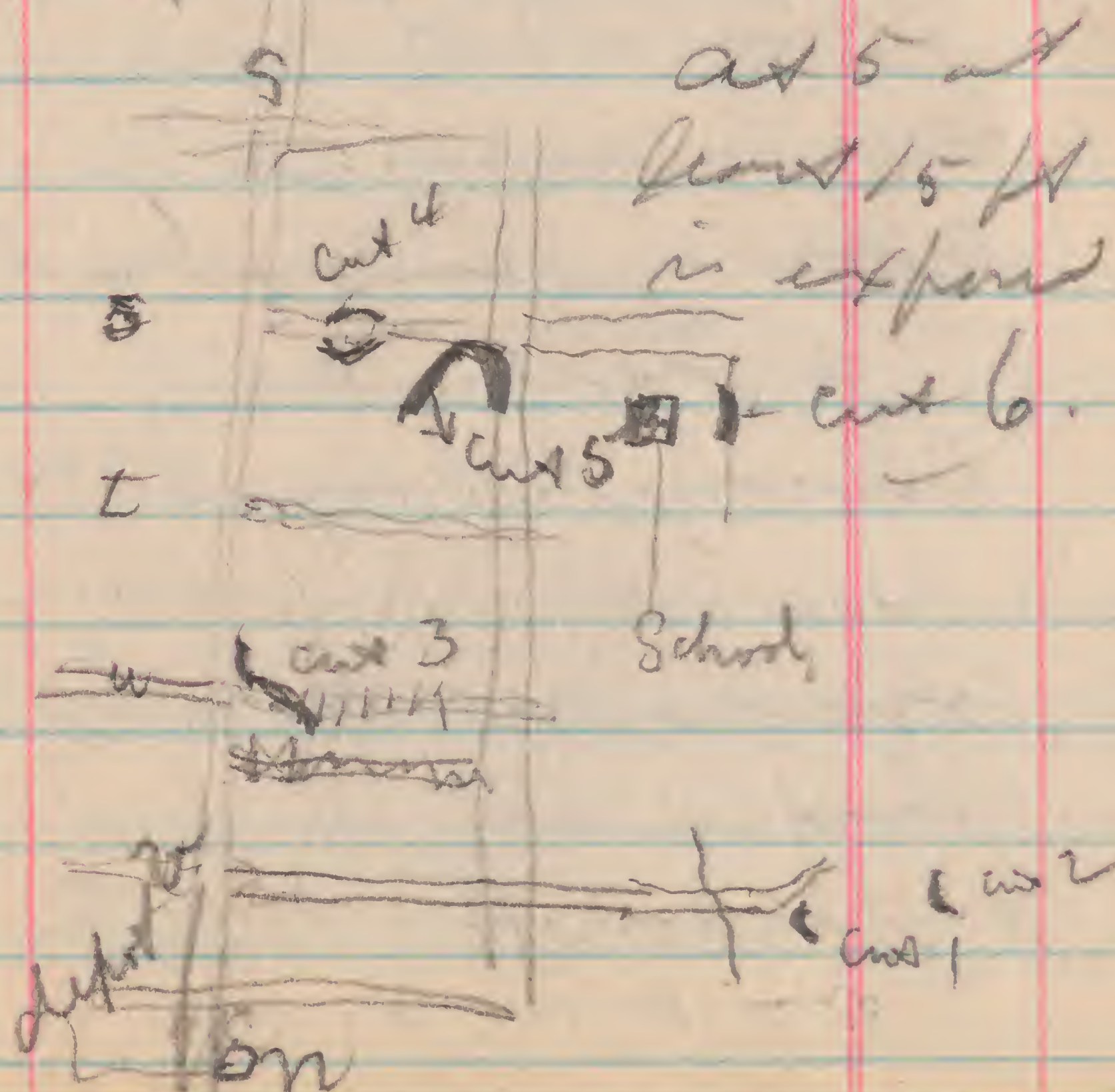
There are nodules  
more or less throughout  
d Below, c runs into  
d, which is again  
a waxy joint clay.  
(like my chocolate  
band.)

The iron band seems  
to run ~~horizontally~~ slightly upward  
into hill.

Fossil lime nodules  
which had formed  
around roots in  
fossiliferous layers.

The fossils are all  
~~chiefly~~ from c, &

upper part of c  
Ex. 5 Further W, ~~at~~ top  
of hill is an exposure  
of light yellow (light)  
loam, with nodules &  
a few fragments of  
fossils. This is  
undoubtedly later than  
c of the ~~same~~ cut  
cut 7 4, as that dips west





cut 6 is at top of  
 hill at school house  
 It is about 15 ft  
 deep, in front  
 light yellow loess  
 which shows nodules  
 & lamination almost  
 horizontal on  
 weathered surface  
 It follows contour  
 somewhat  
 Fossils are not  
 abundant, but  
 scattered all  
 through - few.

Loess in cut 6 is like  
 that in 5.  
 I marked shells, etc  
 from cut 4 as

from yellow loess.  
 White loess is yellow  
 more or less, the  
 layers seem to be  
 same as blue loess  
 of cut 3.  
 It is c.

Base of cut 5 is  
 65 ft. below top of  
 cut 6.

Shell layer in cut  
 4 is about 20 ft  
 lower than base of  
 cut 5.

Strat below cut 4 is  
 100 ft. lower than top  
 of cut 6.

How



Cut 7 is 2<sup>1/2</sup> blocks  
 S. of cut 4 street  
 on top of hill off  
 Christchurch. It is  
 bluish brown,  
 quite compact,  
 with iron tubules  
 & some nodules,  
 no fossils.  
 Resembles unlaminated  
 C in cut 4.  
 see samples taken  
 3 ft. from top.

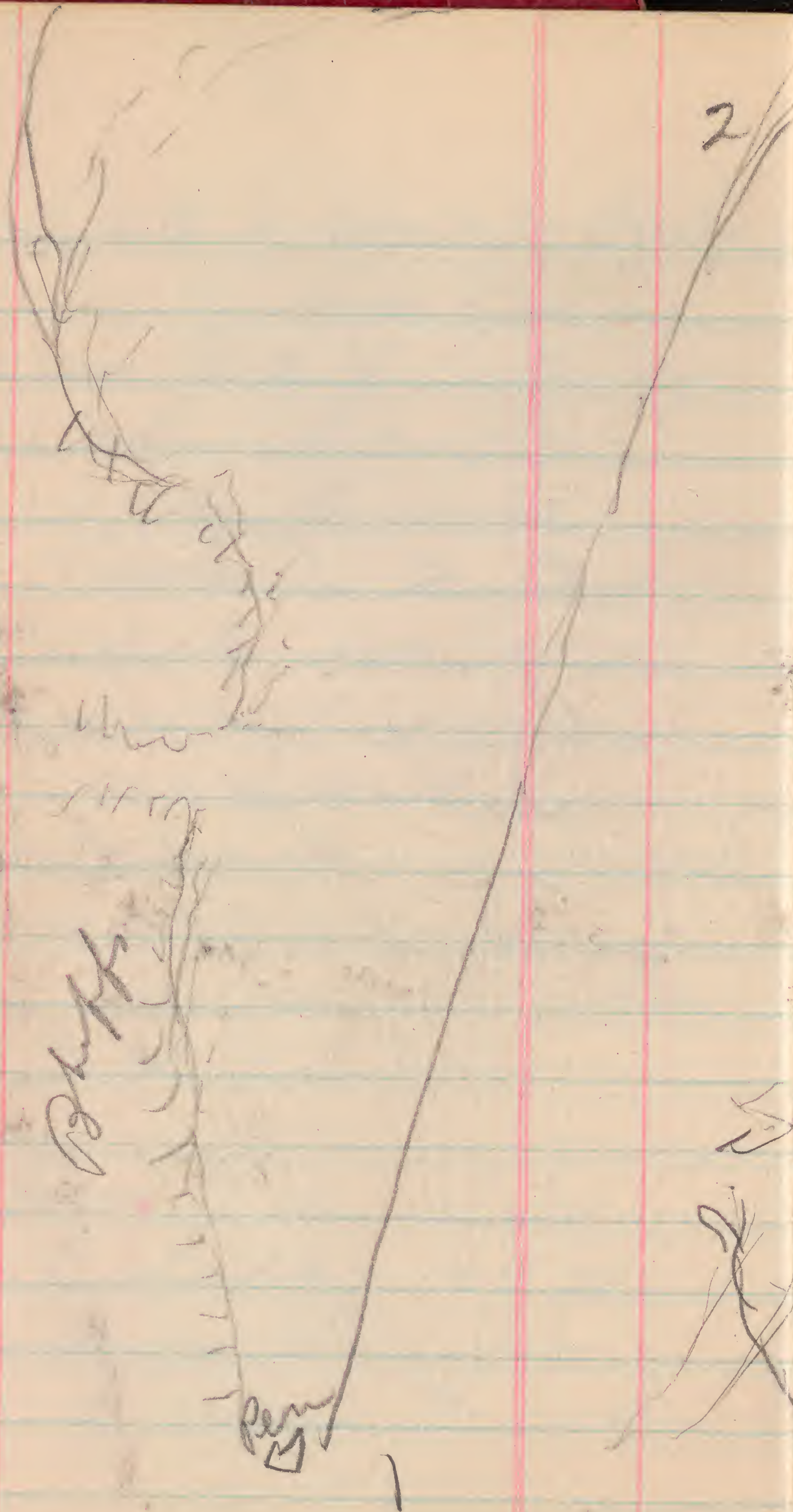
Cut 7 is still  
 probably 40 ft  
 lower than top  
 of ridge to west.

(r) (cut 7) is 60 ft  
 above S.  
 From S to T nearly  
 level.  
 Then drop from  
 T to U about 8 ft  
 & from U to depot 6 ft  
 From U to V drop  
 about 15 ft.  
 From V to depot drop  
 about 6 ft.



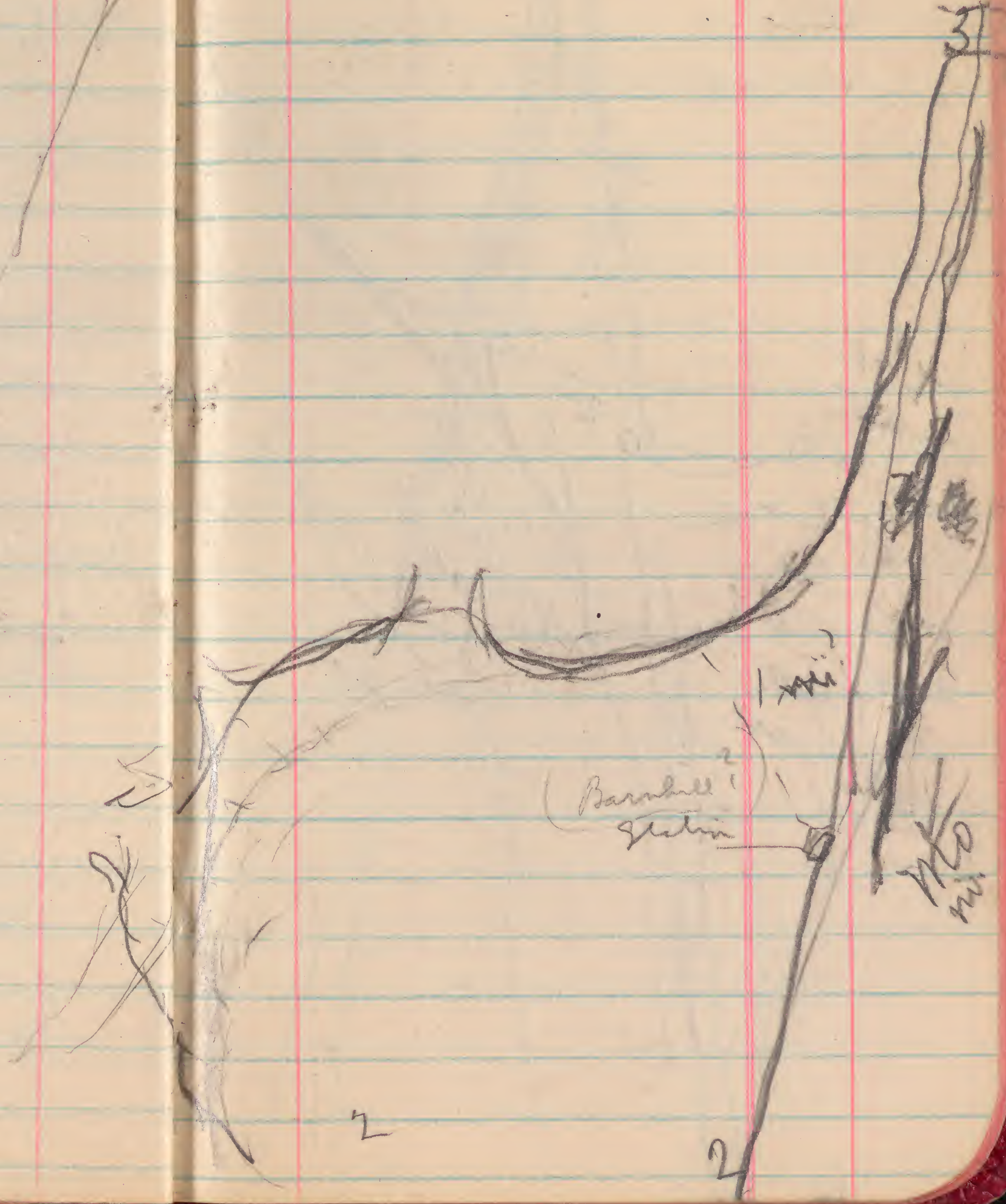
74

2

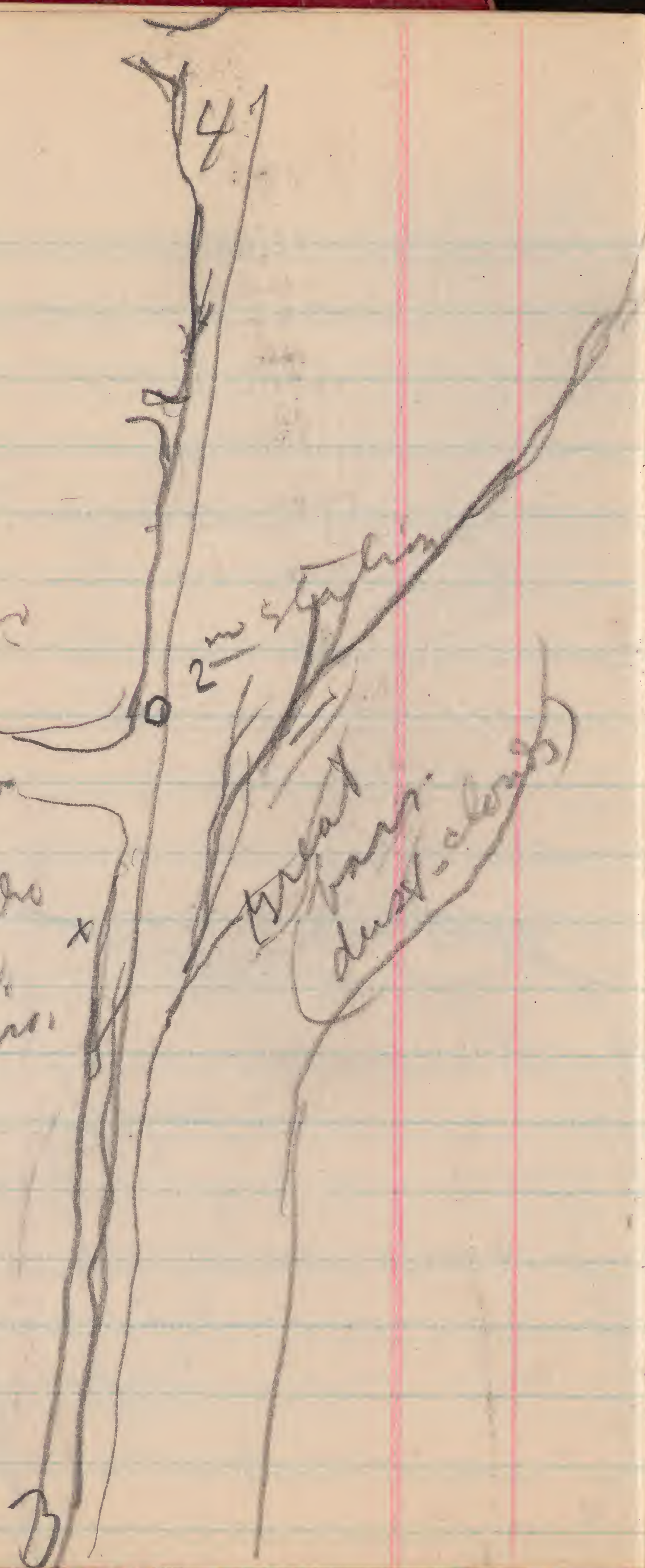


75

3







just before  
morning  
at (18)  
black smoke  
very no  
longer, like  
at Paris  
also been





78

6

mid air  
D

pen cut  
5-110.2

79



Sept 2 - Went out to mill on Walnut creek. Found no water skulls by digging or otherwise. Found some low skulls under logs & timbers.

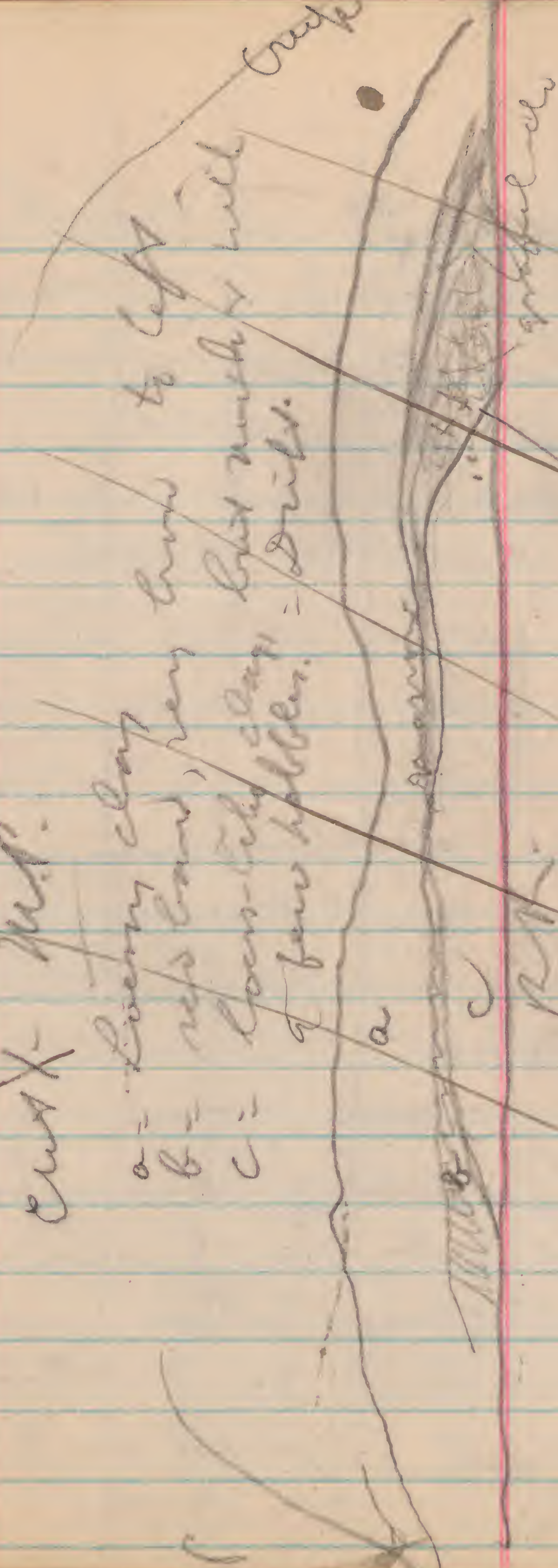
Cut 6. in places rarely flooded. 1st cut along WP is just beyond Walnut creek.

The lines between a, b & c are quite sharp & abrupt. The uppermost layer may be loam.

Found I saw the red layer is very wide & has lot of pebbles & sand.

6. cut - West.

- a = loamy clay
- b = red sand, very brown to light
- c = loam-like clay - but much with few pebbles - Drills.



Pebbles lots dark + red.

Foot of hill is a b c blend of layers of pebbles, etc.

ax



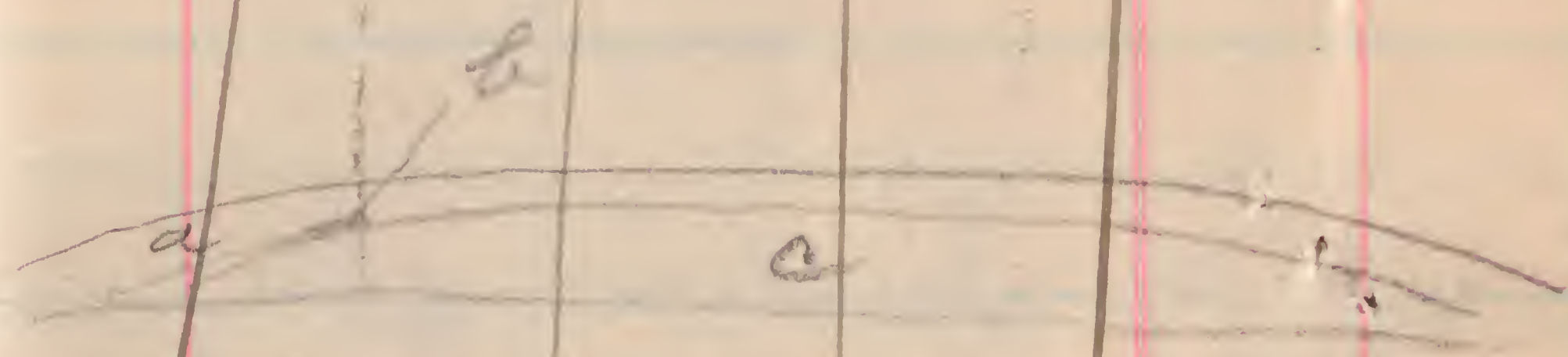
7  
Cut 2 is deeper  
(<sup>or 18</sup> 15 ft), & shows  
red layer, brick  
on top, with  
occasional small  
pebble & bluish  
joint clay below

The miller says it  
is  $3\frac{1}{2}$  miles from  
the mill to the  
court-house by  
wagon road.  
The court-house is 2  
blocks W. of the  
Watson Hotel.  
I had to go 8 blocks  
W. of Hotel before  
turning north.

9  
Cut 3 is a long  
cut - 60 rods -

Very cut of 17 yrs  
ago

It is fully 8 ft  
deep along a great  
part of the top  
down



a = soil & yellowish  
(brownish) loose loess.

Some some heavy  
strongly oxidized layer  
seeming to include both

a & c.  
c typical the



loess, with laminae  
in structure, a few  
nodules, and  
very tubes. &  
this time I found  
only a few fragments  
of shell in lower  
part.

<sup>8</sup>  
Cut 4 is at least  
15 ft deep & seems  
to be throughout  
compact yellow  
loess - with  
some nodules, black  
spots & blue  
bands & streaks  
below. (See sample)

<sup>9</sup>  
Cut 3 seems to  
be higher up  
than cut 4 &  
4 is higher than  
~~3~~ <sup>7</sup>  
In cut 3 is high  
grade of RR, as  
it slopes both  
ways.

The lower part of  
loess in cut 4  
looks rather old.

<sup>8</sup>  
Cut 4 begins about  
100 yds beyond  
cut 3 & is much  
shorter & has more  
abrupt slopes.



Toward W. end of  
cut § 9 I found a  
good many  
lime nodules in  
the blue loam.

In cut § 9

a is 2 to 3 ft  
thick, most of it  
blackish soil.

b is indefinite, but  
mostly about a foot.

c - shown at least  
6 ft. I dug into  
it a foot below  
RR. but did not  
get through it.

Sept. 3-1906  
Return to cut

3

1 yellow loam  
2 } red loam  
3 } drops - yellow

4 } joints clay  
flint

5 shale.

2 shales and 3, they  
are one.

5 is reddish joint  
clay & shades  
into it. It's one  
layer.

1 = 2 ft to about 6 or 8

2 + 3 = 6 to 12 ft or more

4 = 5 - 6 ft

at the end

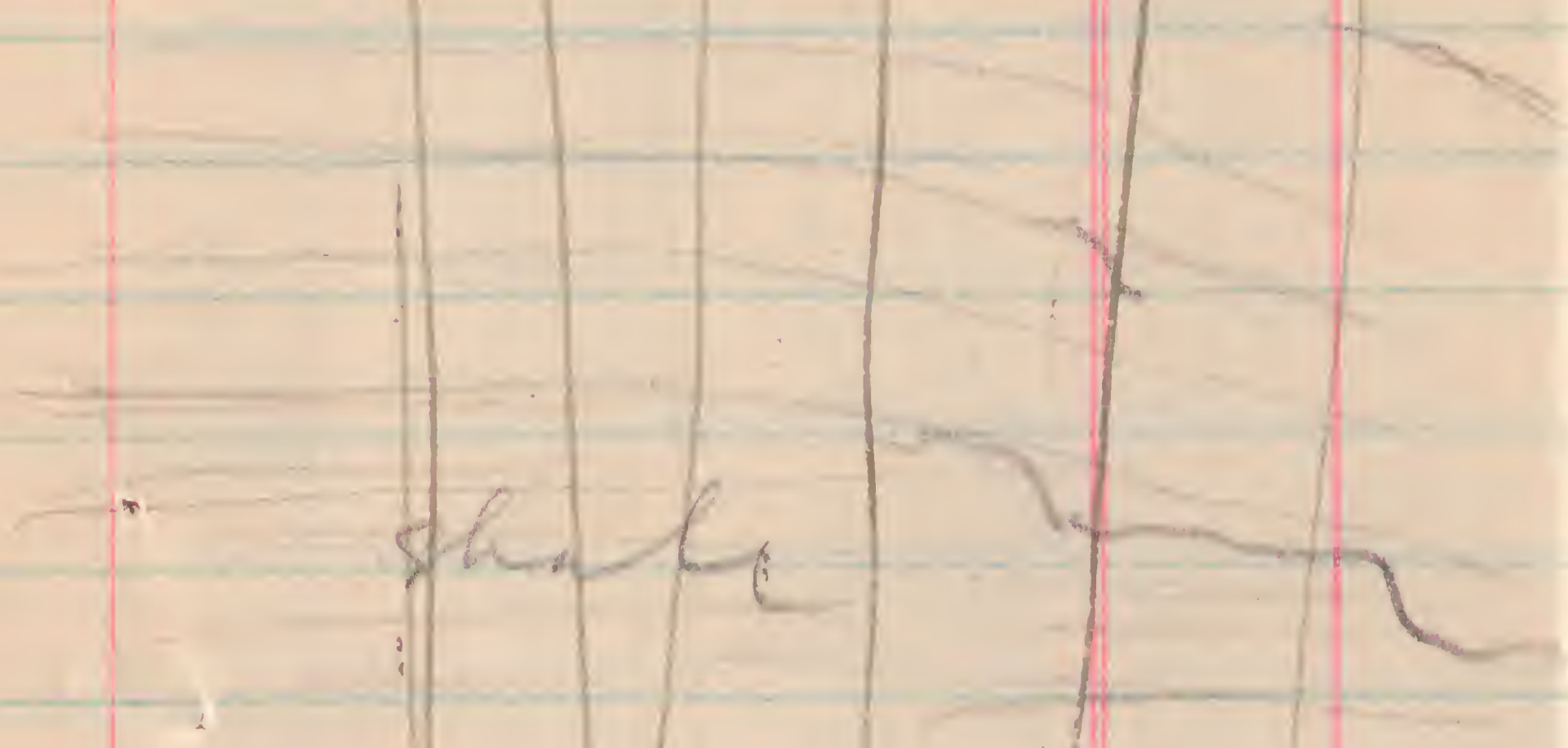
5 = 6 - 10 ft.



88

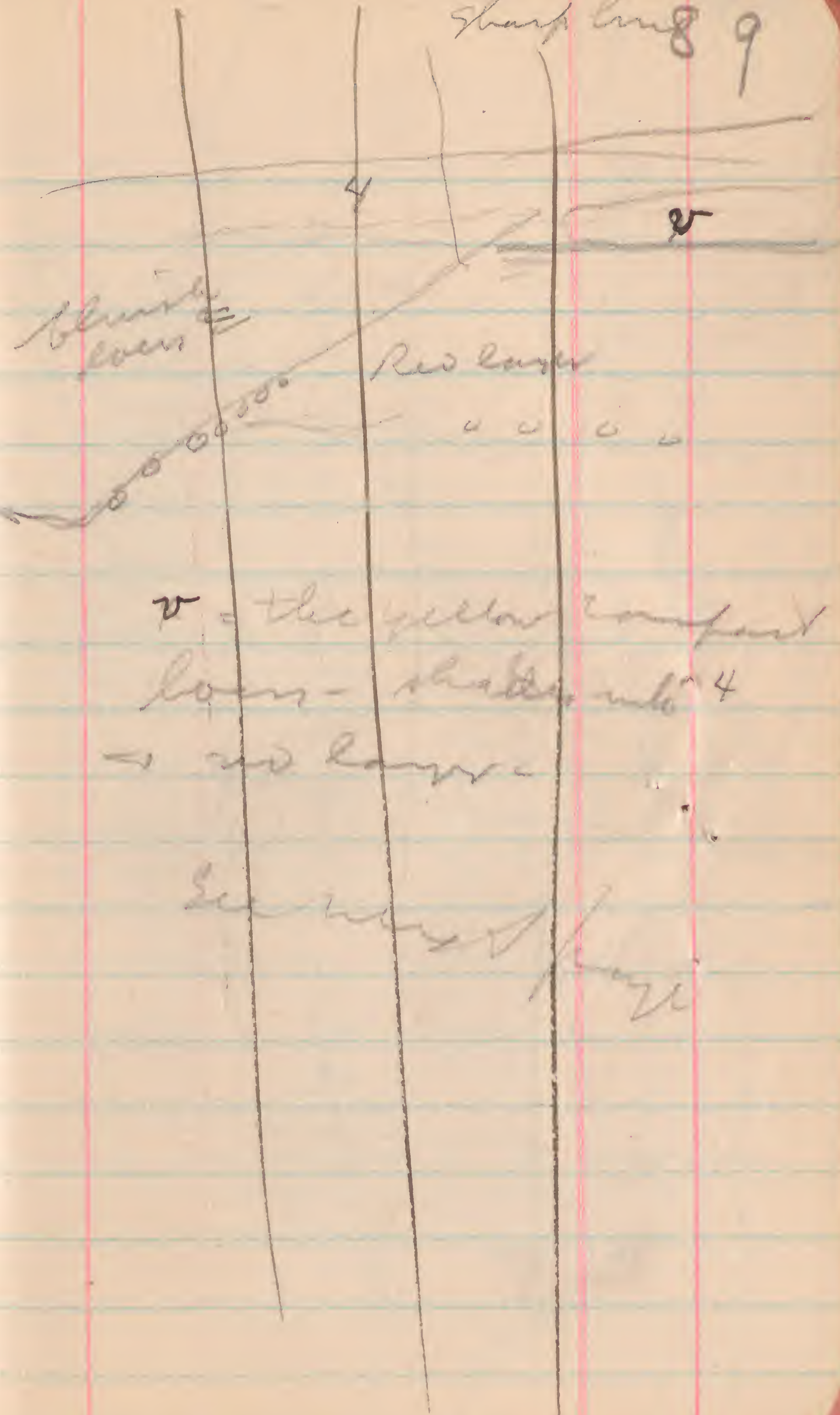
(~~W.D.~~)

The south end of cut  
3 & is nearly horizontal  
but shale dips  
to N.



In cut 2 (Canyon cut)  
The blue loam & layers  
out to less than a  
foot eastward.

Sharp line 89



bluish  
loam

Red loam

v - the yellow loam part  
loam - shale into 4  
no loam

See notes page 88



9.0

4  
existing yellow lines  
moderately

Red layer  
ooooo

This part shows well 4 +  
red layer is not distinct

91

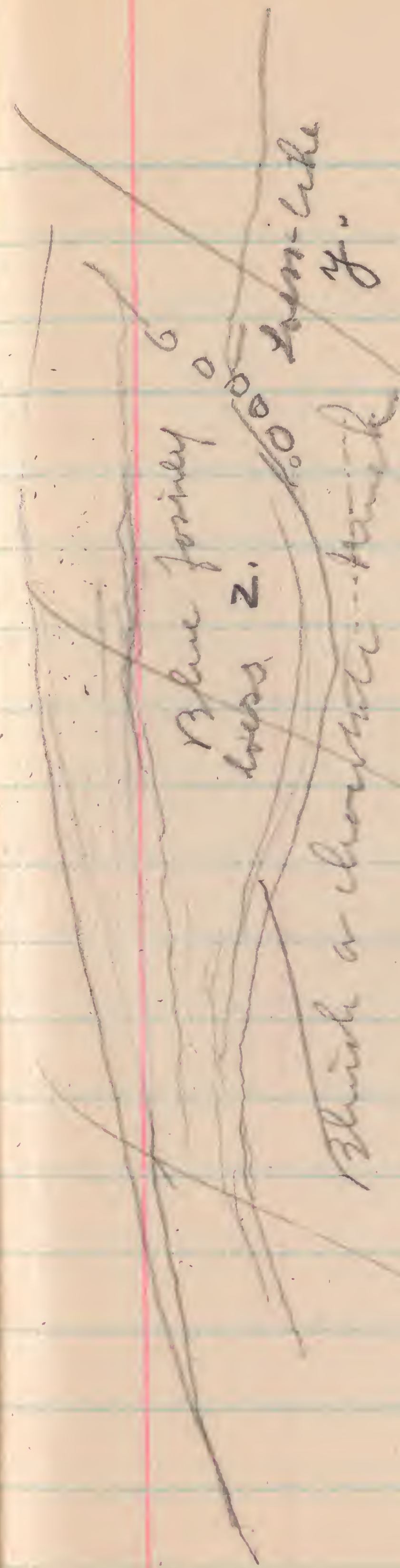
bt,

yellow line

moderately



It appears to me  
that the yellow loess  
of cut 4 along H.P.  
of cut 3<sup>2</sup> Neb.  
City are the  
same.



2 in / family - Blue loess with iron tubes  
4 - is like it, but has no family

See sample



94

95



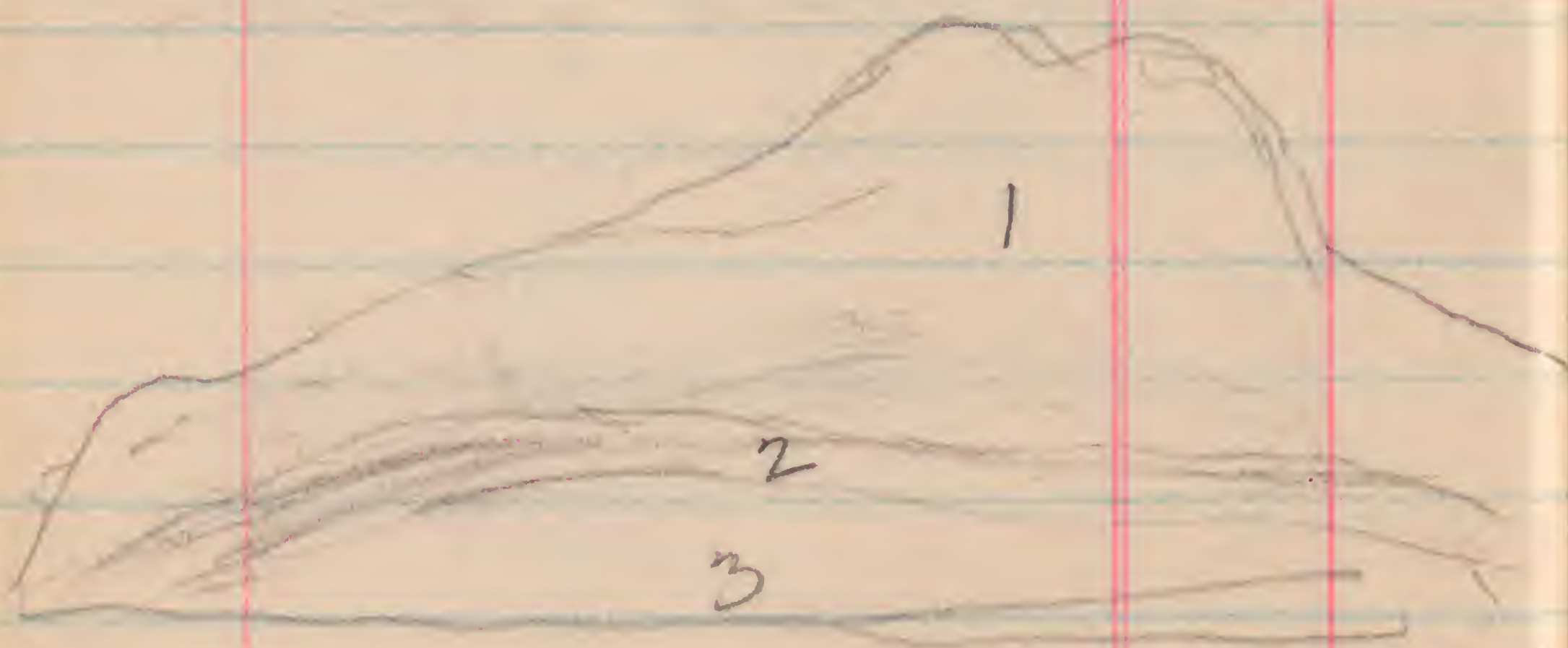
Hamburg, La.  
 First unit exposed  
 at school house, at  
 end of ridge.  
 The sand has been  
 cut away

Cut 1,

about  
 30 ft.

House  
 barn

street



Looking N. E.,

- (1) is light yellow loess with some nodules & fossils. (This is where my fossils came from before.)
- (2) Is the red band ("red loess"), changing in short distance above into loess & below into 3.
- (3) - Is much like (2) & in a joint clay, somewhat yellowish or brownish.

The boulders reported before are probably just below (3)



I climbed up the  
W. slope & collected  
fossils on lower slope.  
in yellow loess.  
This loess, however,  
is not the light loose  
kind but a more  
compact & in places  
toward base a brownish  
loess.

There are also, even  
the yellower parts, toward  
base blue streaks &  
band.

The red band of hard  
joint clay shows  
everywhere just  
above level of road  
on W. side of ridge  
(near base).

The ridge is so  
narrow that there  
would hardly be  
room for a wagon  
road, and so steep  
that it is almost  
impossible to keep  
one's footing without  
the aid of the hoe.

These bluffs, at  
least as far up as  
opp. Nebraska City, Jr.,  
are uneven, there being  
places where wind  
formation is more  
pronounced, & these  
are higher, & also  
uniformly bare.  
Where the bluffs



are lower, & recede  
to form depression  
& valleys, with  
lower ridges, there  
is invariably timber.  
Back of the highest  
& steepest bluffs in  
pockets & valleys  
there is also timber.  
Top of 1st main  
ridge (S. end of ridge),  
above reservoir  
is 135 ft. above  
foot of cut 1.  
then drops to 110 then  
rises to 130<sup>2</sup> & drops  
to 105.  
then comes big rise  
to 200 ft. above  
base of cut 1.

On top of this high  
ridge, at pt. marked  
240 ft. in my old  
notes, I found some  
shells, both fossil &  
what I took to be  
Euc. grommi recent.

- ✓ Photo 31 - Looking down  
end ridge from 240 ft  
point.  
Peach orchard in foreground.  
Hamburg beyond.
- ✓ Photo 32 Field of sunflowers
- ✓ Photos 17 & 18 - Looking  
N. along bluffs  
from 240 ft. pt.

at 240 ft. pt. took  
sample of surface loess -  
there is no black soil.



This is fossiliferous  
(see slides)

Still N, on higher  
ridge - 220 ft -  
then some flat topped  
projecting points  
on this fragment



of Union & other  
shells are  
frequent.

✓ Photo 13 - Looking N.  
from 2<sup>nd</sup> ridge north  
of 220 (2 shell) point.

✓ Photo 14 - Looking south  
(back) from

same point, 12<sup>m</sup>  
ridge in foreground  
on Union ridge.

About 7 ft below  
top I found a pocket  
of shells (see box)

✓ Photo N. V. M. along  
hills (see timber  
in shelter valley  
✓ A - toward the setting  
sun - West

✓ 23 & 24 - View of Cass  
Mts. by morning  
9/3/06



104

Sept 4-1906

Went N. from Hamling  
along bluffs.Red layer follows  
from tip of bluff  
about 150 yds.  
then disappears.  
It is irregular

✓ Photo 5 is a loam  
ridge with calcareous  
lenses at base  
also of (slender) loam

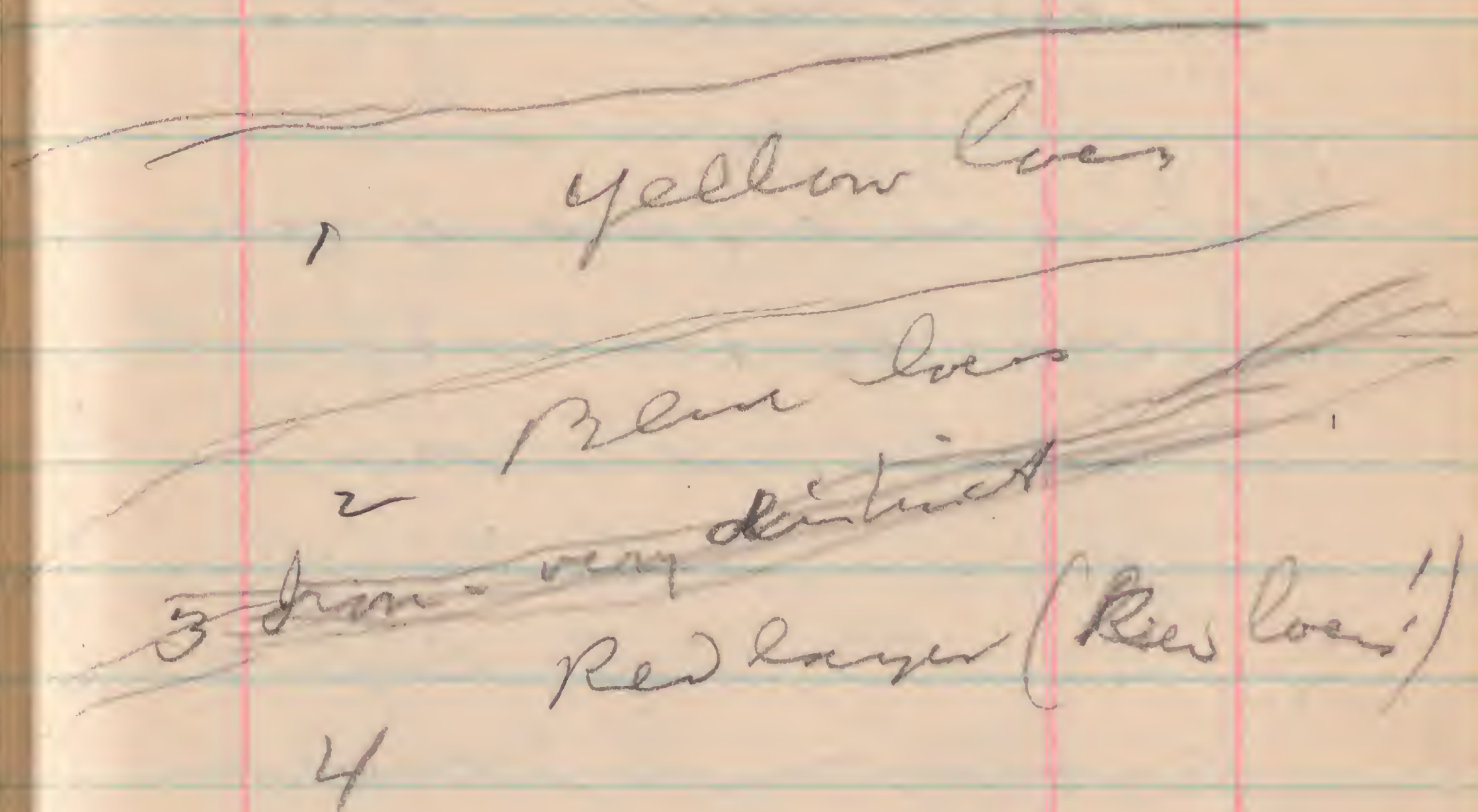
✓ Photo 6 - is cut 6. Along  
road

yellow (crayish) loam.  
Blue loam. Ferrugineous

"Red loam!"  
The road here is only a little  
above bottom - a few feet

105

Cut 6 is 7-8 ft deep  
right next to road &  
is as follows:



- 6 { 1 - in yellow (dull) loam with  
small nodules & a few  
fossils (see box)
- 2 { 2 - Is indurated blue loam  
with few small root tubes  
& a few rotten nodules
- 3 - Brown & yellow loam 1 ft



4 is like Willson's  
new loess, but is  
real joint clay.

Took samples of 1 & 2

Cut 8. is an exposure of yellow  
loess (like 1 in cut 6) with  
nodules, & a few  
fragments of brachiopods.  
It is 8-10 ft. high &  
runs down to bottom land

Cut 9 is beyond creek, at  
foot of very high ridge  
on a long approach  
to it.

At 9. end it is all  
yellow jointed loess  
like 1 in cut 6.  
A little fragment

along blue loess appearing  
also jointed. &  
finally red layer.





- 1 is very fossiliferous in places, & there are little bands of broken shells, as if there has been wash.
- 2 - Is blue loam with few iron tubes & some shells.
- 3 - Is hard somewhat reddish stuff, evidently joint clay, though compact & uniform the lower above 3 shows lamination & that for a ft. or 2, & there are streaks of blue loam extending to left (N.) where it disappears.

The line between 1 & 2 is not sharp & there seem to be some mixing of 1, 2 & 3.

View N (photo) <sup>W</sup> slope of high ridge above cut 9

✓ 27 & 28 - view N. from top of high ridge 235 ft above road at church  
 X - Looking N. along comb of ridge  
 XX - " E. of N. into protected hollow

Top of high ridge is 235 ft. above road at church  
 The mean surface level is 190 ft.



110

I found recent shells  
on ~~western~~ side of  
ridge as far up  
as trees & shrubs  
go - to less than  
20 ft from top.

111

P.M. went S. into Atchison  
Co. Mo.

✓ B (photo) of ridge  
whose faces on valley  
is bare & immediately  
around an angle tree  
are abundant.

Looking down river I  
could see that as the  
bluffs curved westward  
6 or 7 mi below state  
line the whole face  
of bluff was  
timbered - like  
Missouri side.



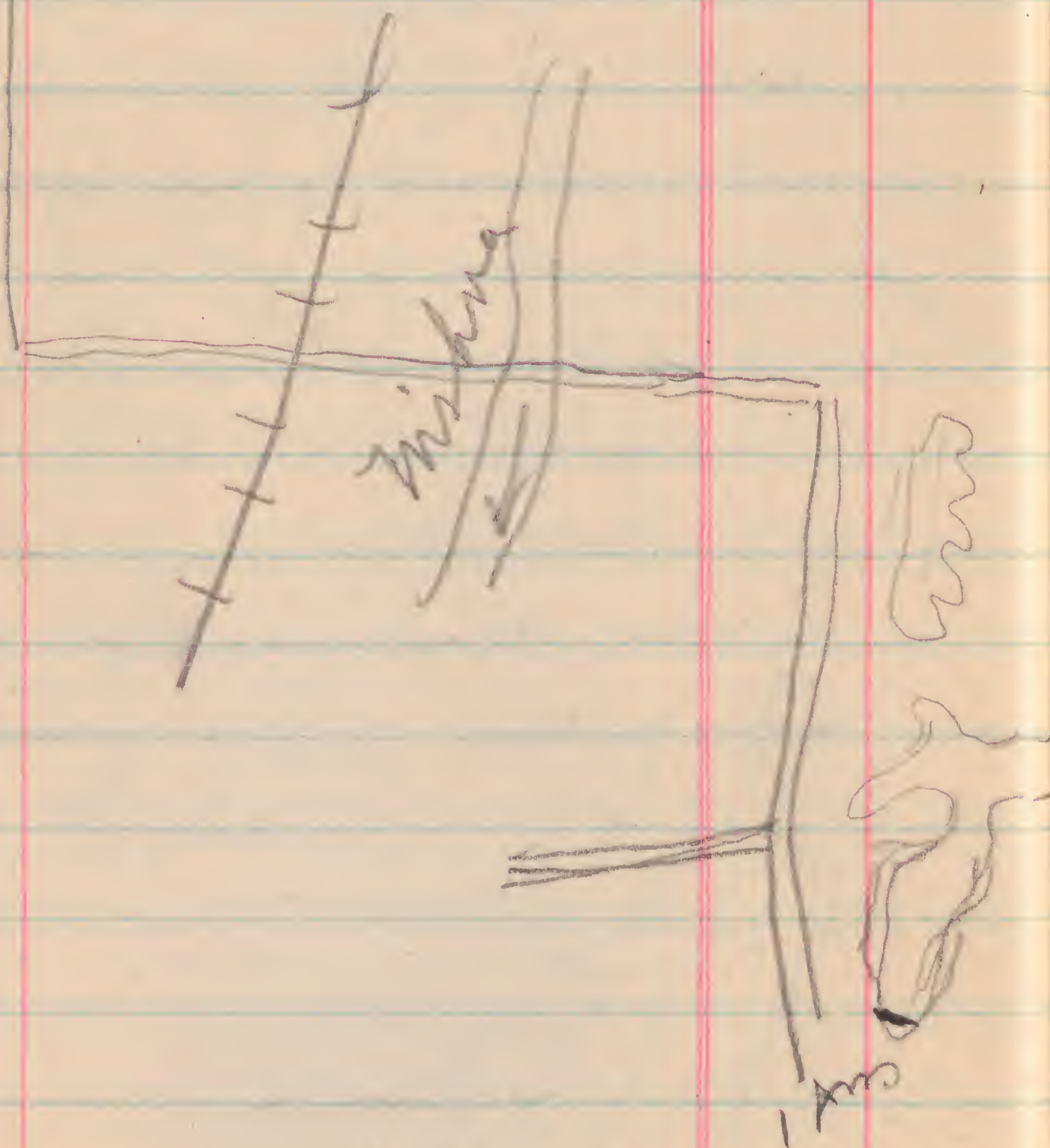




114

N

Hambling river



S

115

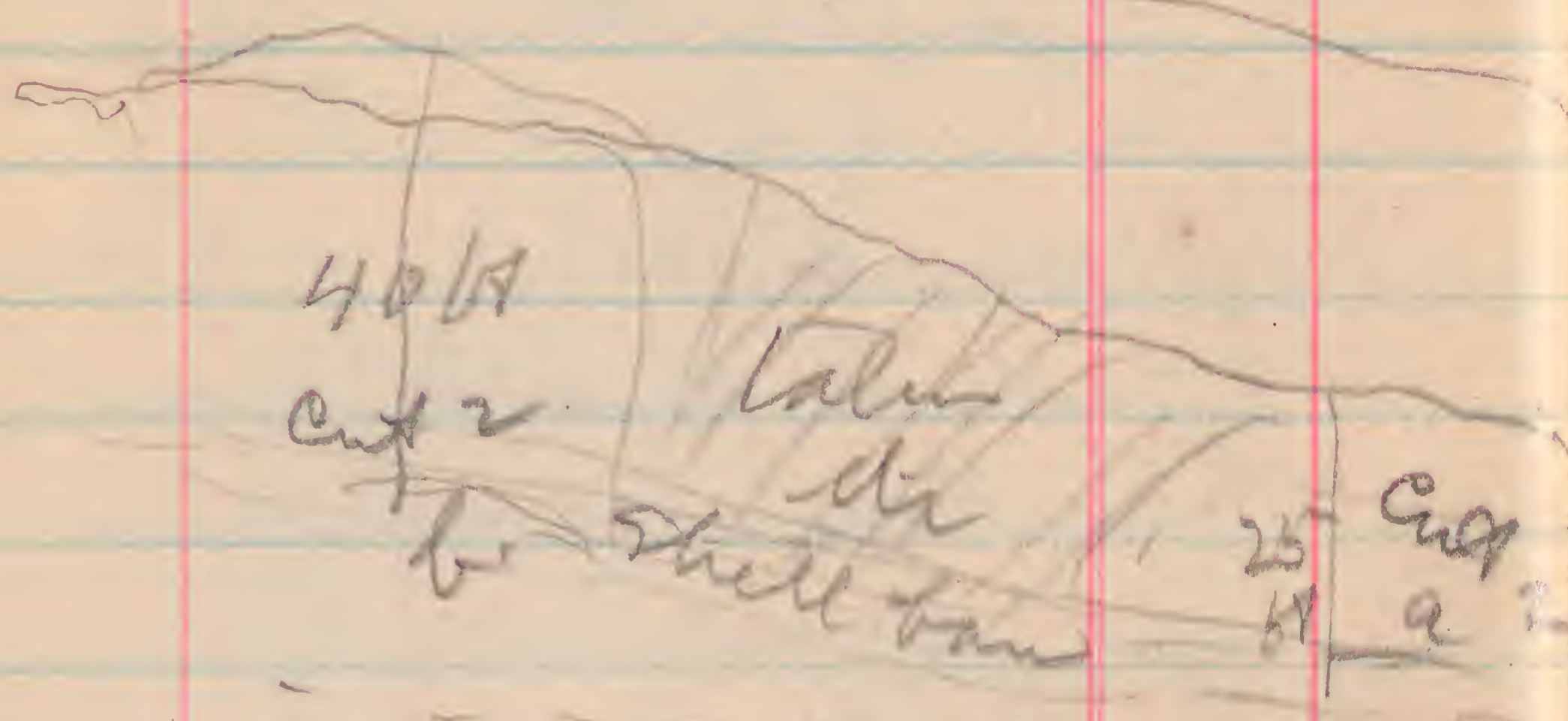
As cut 1 the lower  
2 or 3 ft. are  
reddish joint clay  
(the red layer)  
No fossils in this.

Cut 2 is a few  
feet higher (about 10)  
than cut 1, & runs  
upward toward N.  
It consists of the  
same kind of loam,  
but a little higher  
below & shows  
a little of  
red layer.  
Fossils very abundant.  
Nodules - When dry  
the loam is very hard  
when dry, slightly brownish.



116

with black root-  
lines & calcium  
spots & lines, as  
well as nodules  
The shells seem  
to be in a band  
about 8 ft wide  
whole exp is 25 ft  
(estimated)



Shell band follows  
contour somewhat.  
Exp. 2 run for  
200 yds (estimated)

117

but is partly covered  
in places.

In evening packed boxes  
of plates, Nos. 7 &  
8.



Aug. 29 Accounts

Glenwood lunch	.25
RR. fare Belpm to Red Oak	.73
<del>Bike</del>	.25
Aug. 30 Hotel (Evening) Red Oak	1.00
Lunch " "	.20
RR. fare to Malvern	.58
Bike " "	.25
RR. fare Malvern to Sheridan	.68
Bike	.25
Aug. 31 - Hamburg - Julien Hotel <sup>Exp. City, &amp; Bkfst.</sup>	1.50
Drayage —	.15
Express charges <sup>Adams Exp.</sup> <del>anger</del>	.45
RR. fare to Webster City	.72
Bike	.25
Drayage, Neb. City	.25
Baskets	.05
Sep. 1 - RR. fare to Peru	.45
Dinner, Peru	.50
RR. fare to Neb. City	.45

Sep. 3 - Neb. City	8 5.00
Hotel Watson 2 1/2 days	
RR. fare to Hamburg	.72
Bike	.25
	<hr/>
	14.43



120

Lamsony, Nebraska E. G.

Shirts (colored) 11

✓ Undershirts 11

✓ Drawers 11

✓ Pairs socks 11

✓ Handkerchiefs 11

Box 6 Neb. City, 8/31/06

Packed Aug. 31

6

5

B whole of Calum cut <sup>with limestone roots</sup> <sub>20 ft. long</sub> Calum cut is four parts.

A - x to 7 of Calum cut - Neb. city Aug 31 -

x Box in Mo. Neb. City

xx " " " " "

24 Looking SW. into inner timbered valley

23 - Looking SE down river from top of ridge

18 } near river of cut 3

17

32 } n. side cut 3. Perm.

31

14 } E. side of cut 3. Perm. Neb.

13

Packed at 21  
Nebraska City

Aug. 31 - 1906

Box 5 (shows this bet)

18

17

28

27

22

21

14 } cut E. of Red Oak

13

24

23

S

R

n

m



122



